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UNITED STATES NAVAL INSTITUTE PROCEEDINGS

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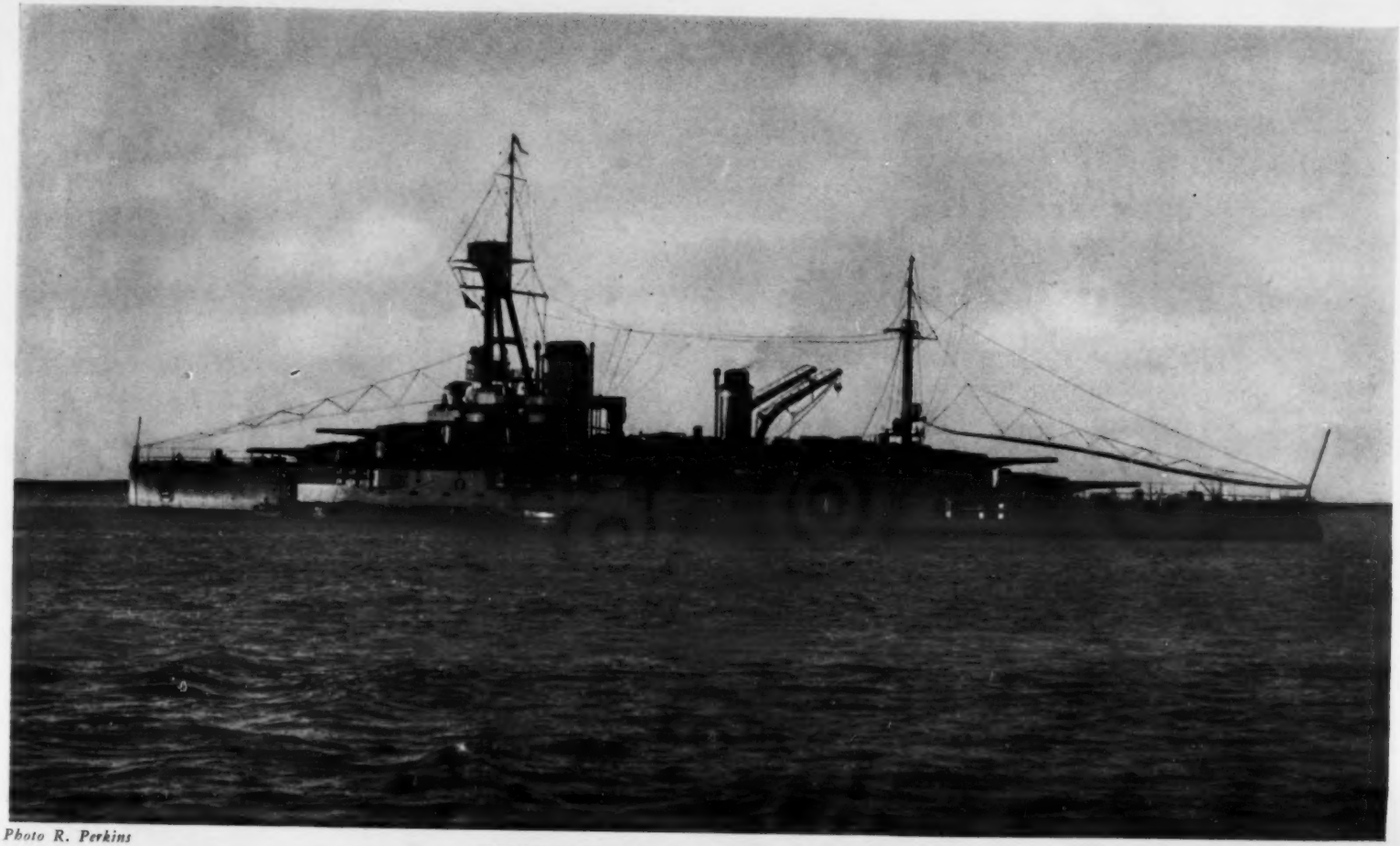

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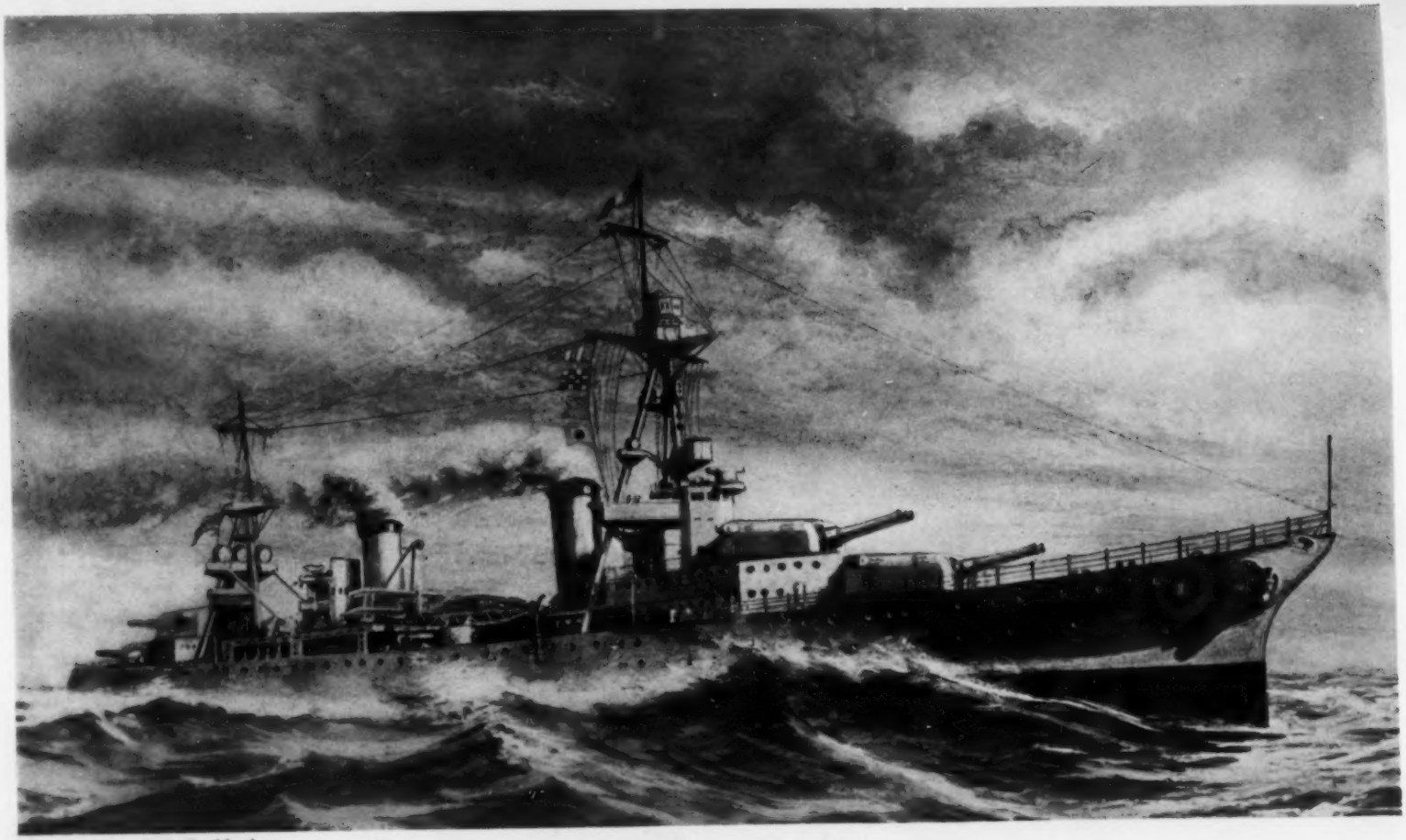

From a painting by I. R. Lloyd

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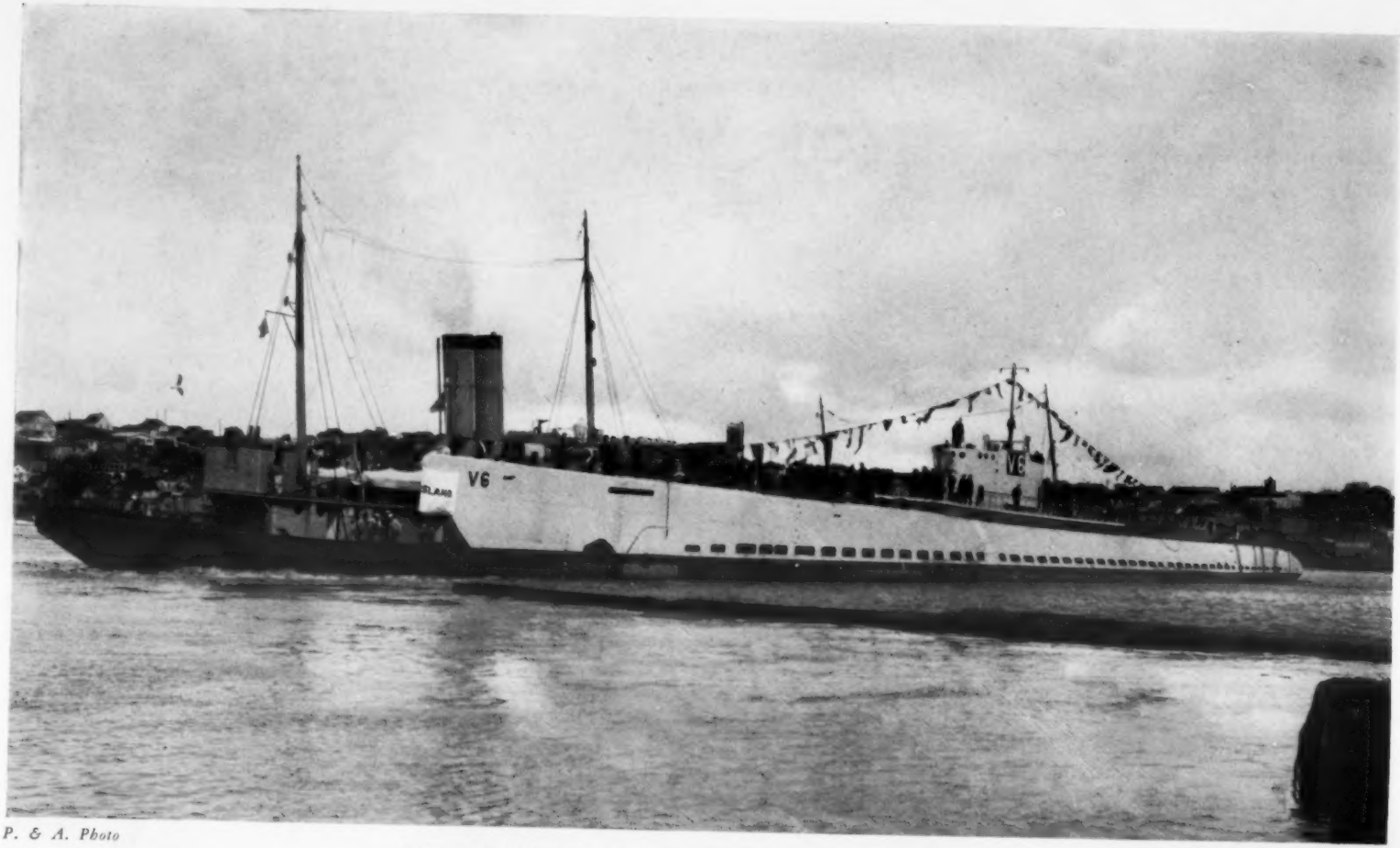

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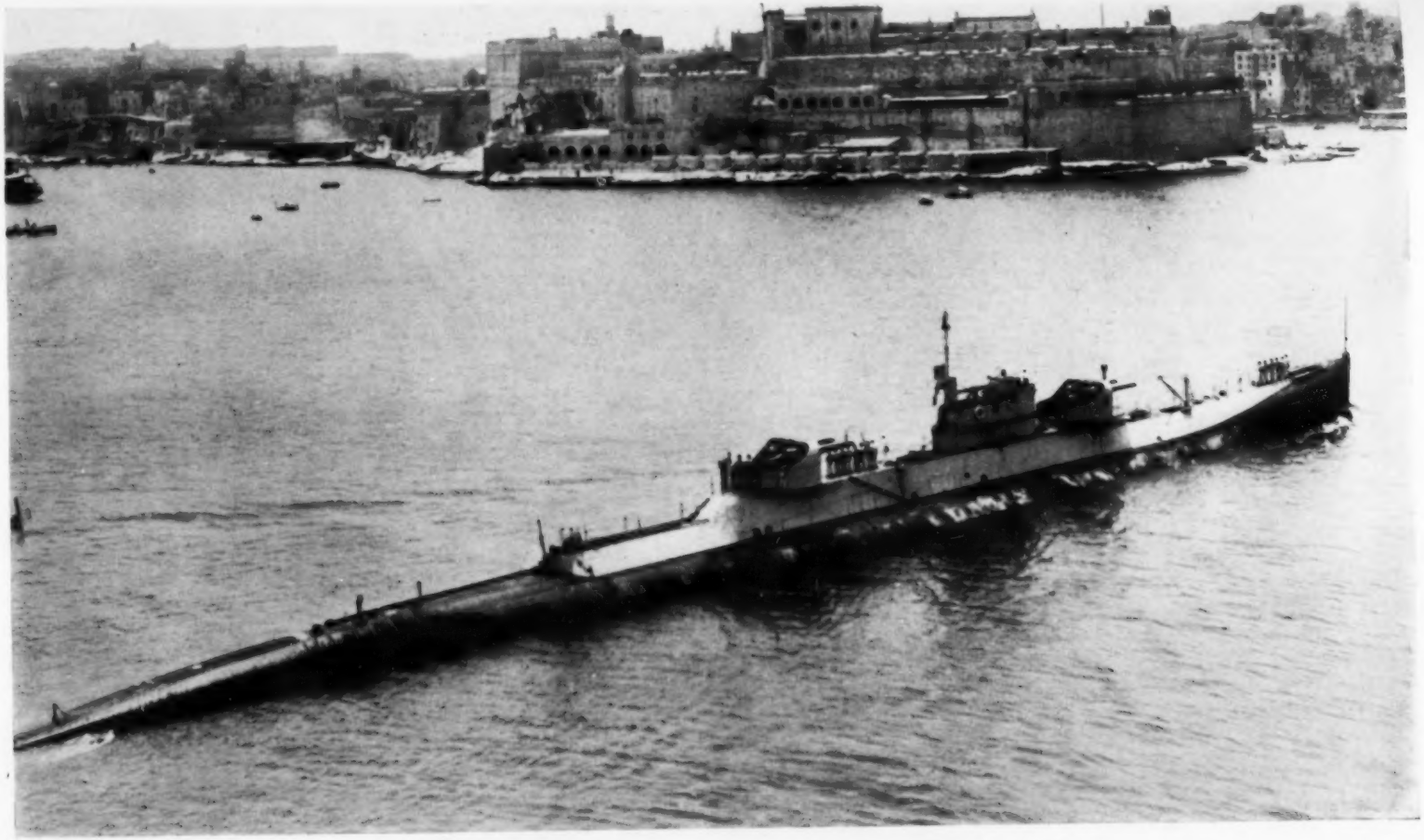
LAUNCHING OF THE U.S.S. *V-6*, SISTER SHIP OF THE U.S.S. *V-5*

The *V-6* is shown as she made her official début in the water at the Mare Island Navy Yard. She is 371 feet long, and has a displacement of 2,760 tons.



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THE BRITISH SUBMARINE *X-1*, LATEST TYPE OF BRITISH UNDERSEA CRAFT

The photograph was taken in the harbor of Malta, where she is on duty. The large-caliber guns, mounted fore and aft, on the submarine's deck, make it a formidable fighter. A new departure in the construction of its stern may be seen. Data: Four 5.2-inch; two machine guns and six 21-inch torpedo tubes. Speed surface 19.5; submerged 9 knots. Dimensions 350 x 29.75 x 17.

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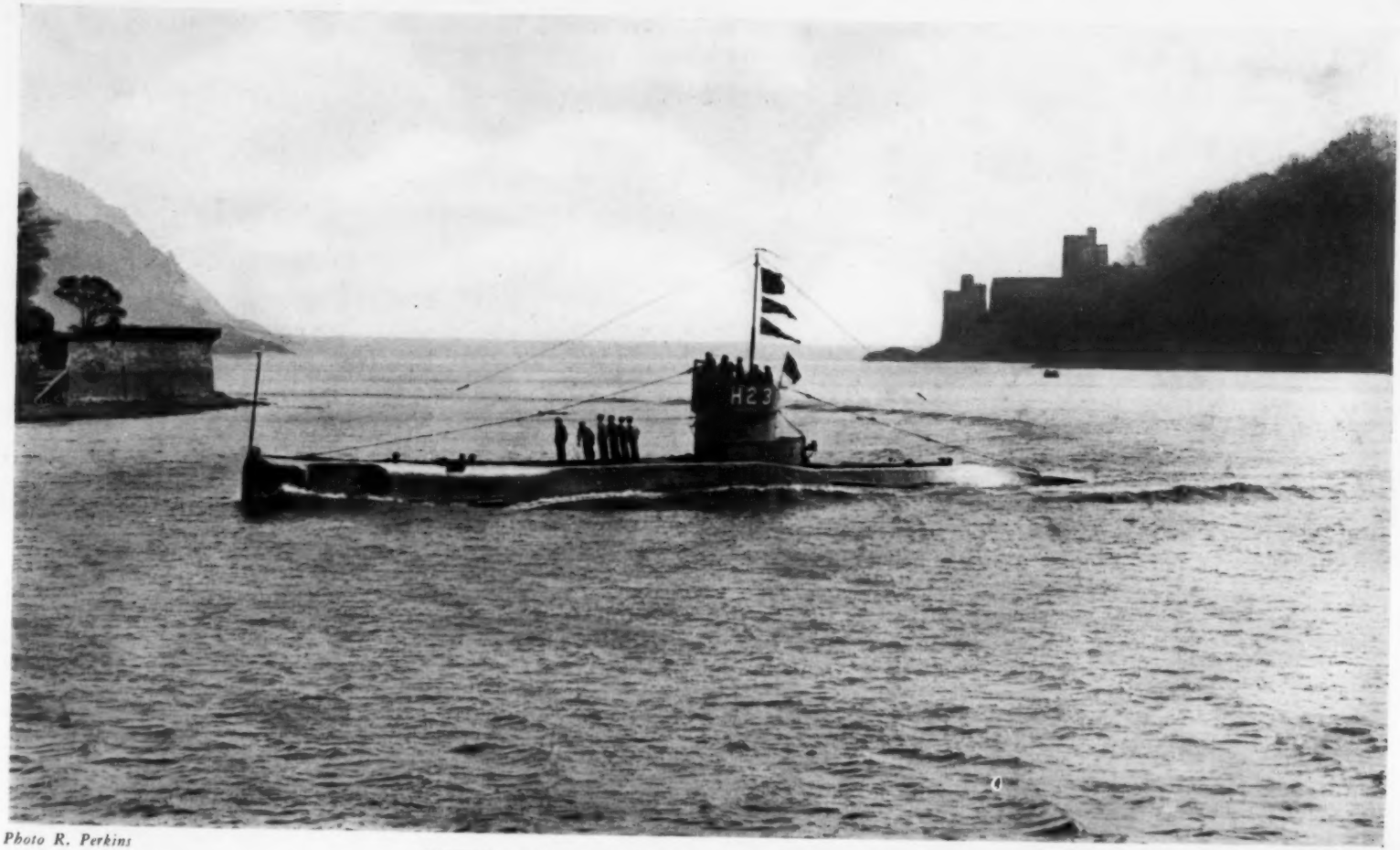

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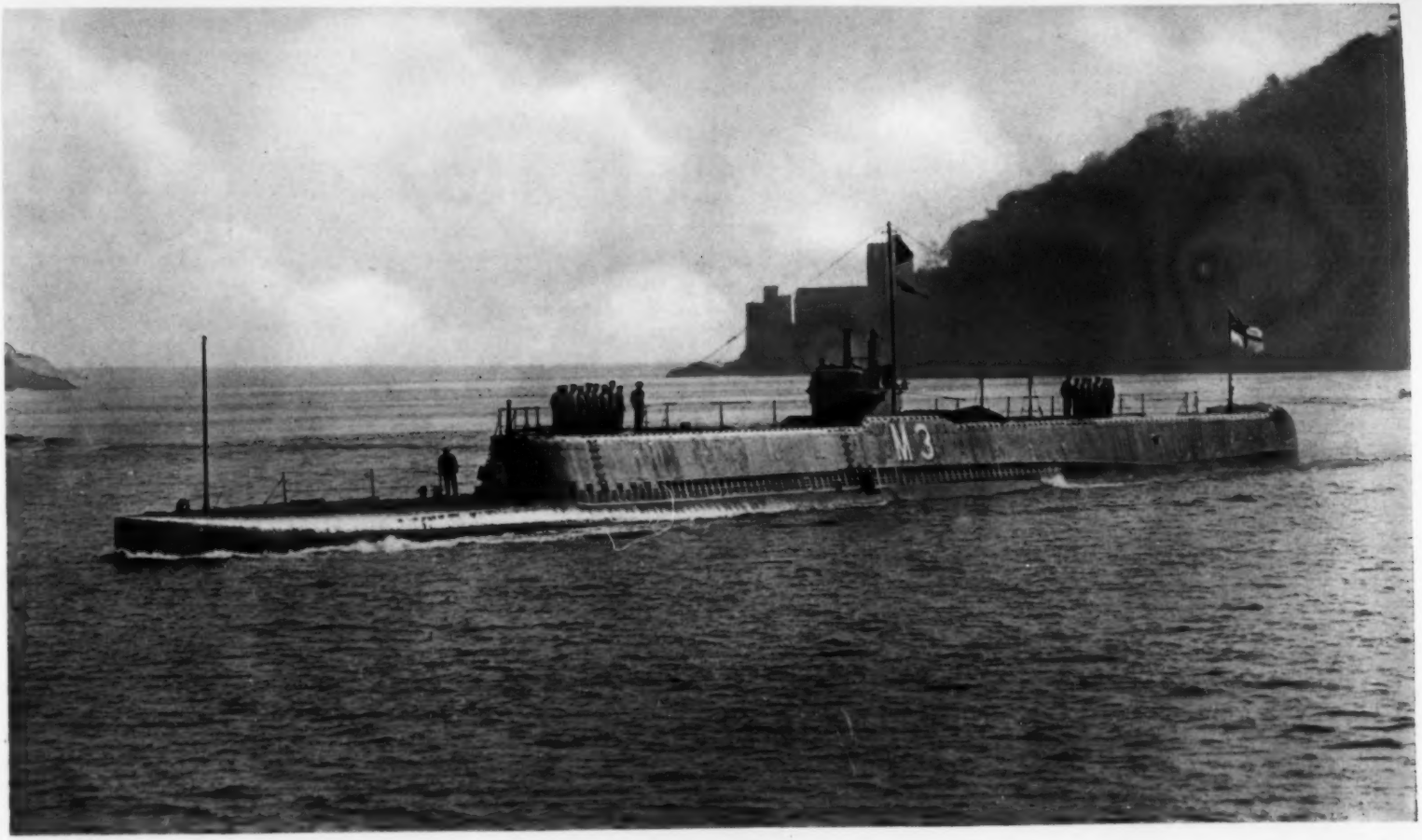
BRITISH SUBMARINE *H-23* AS SHE ENTERED THE DART RIVER
Dartmouth Castle is in the distance.



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THE BRITISH *M-3*

She was recently converted from a submarine monitor with a 12-inch gun to a mine-laying submarine.

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GRIM AND UNCOMPROMISING

Theorists proclaim the uselessness of the battleship, but practically all nations retain as many as they can afford

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Courtesy of Berwind-White Coal Mining Co.

From a Painting by Charles Robert Patterson
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CONSTELLATION AND INSURGENT

It is not generally remembered that for two and a half years the United States waged a vigorous naval war against France. During this period eighty-four armed French vessels, nearly all of them privateers, were captured. War was declared against France on the 7th of July, 1798, and peace was signed on the 3rd of February, 1801. The engagement pictured took place on February 9, 1799.

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Second Honorable Mention, 1930

Sea Power *and* World Unity

By HOWARD G. BROWNSON, PH.D.

The master of the sea must inevitably be master of the Empire.
—CICERO in *Ad Atticus.*

WORLD unity or the breakdown of civilization!—such is the problem. Because the sea routes both unite and separate the inhabitable areas, control of the sea—sea power—becomes the necessary bond of unity. From the time when the first city states of the Euphrates Valley expanded outward along their river communications to the then limits of unity, down through the centuries sea power has determined world unity.

Three times this goal has been approached: first, at the commencement of the Christian era under the Roman Empire; second, in the medieval period for western Europe; now—with the expansion of communication—for the entire world. The British Empire, the League of Nations, the World Court, the Kellogg Peace Treaties, are steps to this end—with sea power the determining factor.

In the following pages the main outlines of this problem are presented: first, the fundamental principles; second, the influence of these principles on successive world states; and, finally, their application to existing conditions. At the close is a short bibliography of the more important references.

I. FUNDAMENTALS OF WORLD UNITY

The dependence of world unity upon sea power rests upon the geographical fact that the waterways separate the inhabitable areas, while penetrating them. Therefore, control of these waterways permits division of the land areas, successive concentration upon each, and penetration inward. The Roman and British empires are examples.

The second factor is that those races dependent upon the sea for expansion are forced to develop leadership. Use of the sea is an acquired characteristic and it acts as a natural selection to eliminate the weak and develop the strong. Therefore, such races as the Greeks, Romans, Norse, Normans, and English—in surmounting their sea barriers—developed the vigor necessary for world leadership.

Through control of the seas come trade, wealth, and culture. From these comes civilization—the science as well as the art of war, of government, of trade, of industry, of thought—supplementing natural vigor with the accumulated experience of mankind. Because the sea routes are universal, the civilization developed therefrom is universal. Therefore, Greek, Roman, medieval, and British civilization has been universal: that of Persia, Asia, and Germany local.

Such is the story of civilization once it passed the limits of Asia Minor: a vigorous race forced to expand over the sea; mastery of the sea and then of other sea powers; expansion outward along the waterways,

with acquisition of wealth and culture; utilization of these resources to dominate the areas tributary to the water communications: finally, development of a universal civilization—continuing with sea supremacy and falling with its loss.[1]

In this advance towards world unity three fundamental elements determine the character of each successive civilization:

(1) *A Central Nucleus,* or state, with the strength to establish unity. Unity implies a central principle. This is the difference between order and anarchy. Thus each successive world civilization has developed around the nucleus of a single state centering in a single strategic capital: Thebes, Memphis, and Alexandria in Egypt; Babylon, Nineveh, Susa, and Bagdad in Mesopotamia; Athens in Greece; Rome in Italy; Paris in France; Berlin in Germany; London in England. The first essential, therefore, for world unity is a nucleus centering authority at a single point, with the strength to unite diverse elements into a homogeneous society.

(2) *Effective Sea Power:* i.e., mastery and utilization of the sea. Sea power is simply national power expressing itself via the sea, in distinction from the land or air. Its basis is mastery of the sea, or seamanship; then mastery of rivals, or naval superiority; finally, the ability to utilize the sea routes for expansion of trade, communications, and civilization. Because sea power is the sole means—unless supplanted by air power—of establishing a universal civilization, it must eventually draw to itself every element of national power—the naval and mercantile fleets, the army, diplomacy, etc.—potentially, if not actually. Because control and penetration by sea are fundamental, essential sea routes must be controlled at all cost; otherwise, the pressure of land power brings it to destruction. Sea power, as an acquired characteristic, must be maintained by continued supremacy over the land—the natural element of man. Sea power—in its broad ultimate extension—must be distinguished from mere naval power, which is only a step to a greater end. Sea power, therefore, rests upon three successive foundations:

Mastery *of* the sea: i.e., seamanship.

Mastery *on* the sea: i.e., naval supremacy.

Mastery *from* the sea: control of adjacent land areas.[2]

(3) *Control of the Mediterranean Axis:* This is specific, because nature has made this sea the strategic geographical center of the globe: therefore, it has been the historical center of civilization. The reason is that it lies as a landlocked, protected, and self-sufficient basin at the heart of the land mass of Eurasia-Africa, with gateways leading to the interior of this land mass, to the Orient and to the Occident. It is the natural center from which civilization can expand outward; while external influences working inward must control it or surrender essential sea communications. Historically, the rise of every world state has been determined by its control of this axis.

Strategically, the Mediterranean is divided into three parts:

(a) *The Sicilian Pivot:* The central point of the Mediterranean; uniting or separating Europe and Africa; dividing the sea in two parts; and forming the center for outward expansion.

(b) *The Gateways—Gibraltar, Dardanelles, Suez:*[3] Controlling entrance or exit to and from this basin, and dividing it into three parts:

(1) North Africa: (Suez and Gibraltar).

(2) Asia Minor: (Suez and Dardanelles).

(3) Europe: (Dardanelles and Gibraltar).

(c) *The Anchor Posts—England, Constantinople, Egypt:*[3] Controlling the flanking sea areas of the North Sea and Baltic; Black Sea; Red Sea and Persian Gulf; and constituting advanced bases for outward expansion.

Upon these anchor posts depend, strategically, the river, mountain, desert, and ocean barriers which protect the inner basin from the outer land masses:

(1) North Sea–Black Sea: Rhine-Danube barrier. (Baltic-Black Sea: German and Russian rivers.)

(2) Gulf of Persia–Black Sea: Tigris-Euphrates.

(3) Sahara Desert:

NOTE: This division should be studied carefully in connection with a topographical atlas: e.g., Putnam's *Historical Atlas.*

[1] Cf. Wells, *Outline of History,* particularly ch. XL.

[2] Cf. Mahan in his principles of sea power scattered in his writings.

[3] Includes Red Sea.

The Mediterranean basin is like a fortified and provisioned castle at the heart of civilization—with sea power the key. The center is Sicily; the inner fortress the Mediterranean basin proper with its mountain and desert barriers; the outer fortress the historic area of civilization cut off from the land mass of Eurasia-Africa by the Sahara and the river-mountain-sea barriers from the Gulf of Persia through the Black Sea to the North Sea and the Baltic. Sea power, centering at the Sicilian pivot, is able to permeate and unite this area, directly or through short land routes, maintain the encircling barriers with their supporting anchor posts, and exert pressure outward on the ocean routes. Unlike the secondary axis at Panama, the Mediterranean basin is self-sufficient, capable of a high degree of civilization, surrounded by successive belts of closely connected territory, and a natural, not an artificial, gateway between the East and West. (The Suez canals—ancient and modern—are easily dredged sea-level routes). Above all, it is the traditional center of civilization.

The strategic importance of the Mediterranean lies in the ability of a vigorous, united nation developing sea power to control the Sicilian pivot and then concentrate successively against the segments of the encircling areas. History is the ebb and flow of civilization, inward and outward, through this strategic area: *inward,* under the Persians, Greeks, Phoenicians, Saracens, Germans, Spanish, French, English, and Americans: *outward,* under the Roman Empire, medieval Europe, and seemingly in the present revival of Mediterranean influence.

Conclusion: The Three Essentials of World Unity

(1) A central nucleus able to establish unity.
(2) Effective sea power.
(3) Control of the strategic Mediterranean axis.

NOTE: Cf. the strategy of the advance of Rome to the unification of the Mediterranean.

II. THE ADVANCE TOWARDS WORLD UNITY

If the Sicilian pivot be taken as the strategic center, the advance toward world unity is seen to consist in a succession of westward-moving world states, with an ebb and flow inward and outward around this point. Three times this has been repeated: *first,* in the Ancient World, with the inward flow of culture from the east and the outward expansion of Roman authority, culminating in the universal Roman Empire; *second,* in the inward flow of the invaders of that empire and the outward extension of neo-Roman influence centering in the papacy, culminating in medieval Christendom; *third,* in the inward flow of Teutonic, Slavic, and British influence following the break-up of the medieval system, culminating in the British Empire—with the World War seeming to indicate the beginning of another period of outward expansion. In each series the circle has widened, and now, with the union of Orient and Occident, the present unification includes the entire world.

The Ancient World: Unification Under The Roman Empire[4]

Civilization originated in the Euphrates valley. From there it spread eastward to the Orient and westward along the Mediterranean. Following the pioneer settlements came a succession of westward-moving dominant states—Chaldea, Egypt, Assyria, Babylon—culminating in Persia, which, gaining control of the maritime states of Egypt, Phoenicia, and the mainland Greeks, advanced into Europe across the Dardanelles gateway; to be checked by Greece in the Aegean; confined to the mainland; and then conquered and Hellenized under Alexander the Great. This was followed by the outward expansion of Greek sea power, which was checked at the Sicilian pivot in the defeats of Athens at Syracuse and Pyrrhus in southern Italy, confining Greek dominance to the eastern Mediterranean. A third advance, that of Carthage, was checked by the Romans at Sicily and Spain in the First and Second Punic Wars.

Following this inward pressure came the outward expansion of Rome. Gaining control of the Italian peninsula, it developed superior sea power in the First Punic War and occupied the Sicilian pivot. Expanding westward, through this sea supremacy, it secured the western gateway of Spain and Gibraltar in the Second Punic War, and North Africa in the Third. Turning eastward, in a combination of land and sea moves, it gained control of Greece, the Dar-

[4] Breasted, *The Conquest of Civilization;* Shepard, *Sea Power in Ancient History;* Wells, *Outline of History,* XXI-XXIX.

danelles gateway, Asia Minor, Syria, the north African coast and Egypt—completing control of the Mediterranean. Consolidating this area under the Empire (Actium, 31 B.C.), Rome expanded outward during the first century A.D. to control the anchor posts of England, Constantinople, and Egypt; maintained fleet supremacy in the North, Black, and Red Seas; developed the barriers of the Rhine-Danube, Tigris-Euphrates, and Sahara; and consolidated the inclosed territory in the Roman Empire.[5]

The Roman Empire rested upon the coördination of the central nucleus of Rome, effective sea power (commercial and military), and complete control of the strategic points of the Mediterranean basin. Within the protection of the outer barriers the combination of sea and land routes encouraged unification, and consolidated the various races and cultures into a common Greco-Roman and eventual Christian civilization. Beyond the Rhine-Danube barrier there also developed an outer belt of semi-Latinized and Christianized Teutonic tribes extending from the North to the Black Sea. Within this area was included substantially all civilization that has influenced subsequent history, forming the first complete world union—"the culmination of ancient and the foundation of modern civilization."

Commencing with the fourth century, the internal strength, particularly the sea power, of the Empire began to decay; the transfer of the capital to Constantinople in 330 A.D. divided it in two, with the temporal capital in the east and the spiritual capital at Rome; and the semi-Latinized Teutonic nations of the Rhine-Danube began to occupy the western part in various nominally dependent Latin-Teutonic kingdoms. In the fifth century growing weakness forced the withdrawal of the fleet and garrison from England, and with this surrender of the western anchor post penetration by semi-Latinized border tribes was changed into invasion by the pagan tribes of the north, particularly the Saxon and Scandinavian sea pirates—occupying England; cutting essential trade routes; establishing Vandal sea power at the old site of Carthage opposite the Sicilian pivot; and, eventually, overrunning the entire Western Empire.[6]

[5] Shepard, *Sea Power in Ancient History*, part II. and sect. V.

[6] Shepard, part II, sect. V.; Belloc, ch. I-V; Wells, XXVIII-XXX.

In the sixth century, a temporary revival of the Eastern Roman Empire under Justinian effected the reconquest of the Sicilian pivot, reëstablished sea power and communication in the eastern Mediterranean, limited the Teutonic advance, and maintained a nucleus of Roman civilization.[7] However, in the seventh century the Mohammedan Arabs broke through the eastern barriers; occupied Syria and then Egypt; pushed westward along the African littoral to the western gateway, into Spain and even France; attacked the Sicilian pivot; moved northward through Asia Minor to the Dardanelles gateway at Constantinople; and by the eighth century threatened to establish a universal Saracen empire. This attack was checked by the land and sea power of the Eastern Roman Empire at Constantinople in A.D. 717; by the Western Empire at Tours in 732; and by the Normans at Sicily in the eleventh century.[8] With this defeat the area of civilization was divided into three parts, based on the three anchor posts: the Latin-Teutonic nations extending southwest from England; the semi-Romanized Saracens east and north from Egypt; and the Greco-Roman Eastern Empire centering at Constantinople.[9]

The Medieval Period: Unification Under Medieval Christendom

With the break-up of the Western Roman Empire the papacy at Rome became the nucleus for the civilization and unification, as well as Christianization, of the Teutonic nations. In the ninth century, the first unification developed under the Holy Roman Empire, including the areas occupied by the semi-Latinized Teutonic nations, in Italy, Germany, and France. Without sea power and the support of the English anchor post this unity disintegrated under the attacks of the Scandinavian sea pirates, threatening destruction of the rising western civilization. However, one branch of these invaders, the Normans of the Seine Valley, accepted Latin civilization and developed outstanding military and administrative ability, with potential sea power. These were utilized by the papacy to develop a second unification of the west in a virtual Norman-

[7] Cambridge *Medieval History*, Vol II.

[8] Davis, *Beauty of the Purple*, introduction and body. Cambridge *Medieval History*, vol. II; Wells, XXXI.

[9] Putnam, *Historical Atlas Maps of this Period.*

papal alliance. Commencing with the eleventh century Naples and the Sicilian pivot were occupied, checking the German Holy Roman Empire and protecting the central nucleus at Rome; England was conquered, and later expanded into the Angevin empire, checking French influence; and a succession of outward attacks, known as the Crusades, were instituted to secure control of Constantinople, Palestine, Spain, the Gibraltar gateway, Tunis, Egypt, and the Baltic. While the eastern and southern efforts were only partially successful, the advance of the Saracens and Slavs was checked; strong sea power was developed in the Mediterranean and the Baltic; and the cultural and theocratic unity of western Europe—known as Christendom—established under the temporal and spiritual supremacy of the papacy, with an outer belt extending on the east to the Norse-Slavic states of Russia, and on the west to Iceland and Greenland. In the fifteenth and sixteenth centuries losses to the east were compensated by the extension of European influence to the New World, and parts of Africa and the Orient.[10]

In the fifteenth century, commencing with the Renaissance and ending with the Counter Reformation, came a third expansion of medieval Christendom, with Italy the cultural and Spain the political nucleus. Controlling Sicily, Naples, the Iberian peninsula, the Gibraltar gateway, the New World and the rising Oriental trade, the Holy Roman Empire, and (temporarily) England—Spain established a dynastic unity in the sixteenth and seventeenth centuries which embraced most of western Europe and the Americas. Sea power, based on the Gibraltar gateway, operated eastward to check Turkey and support the Empire; westward to the ocean trade routes; and northward to the English Channel and Holland. The naval battle at Lepanto (1571) established Christian supremacy in the Mediterranean; but the decisive defeat of the Spanish Armada in 1588 checked unification in the north; while Spanish sea power gradually declined before the rising power of England—ending in the eventual disintegration of the vast Spanish world empire.[11]

In the late seventeenth century supremacy passed to France, with successive efforts to reëstablish the unity of Europe, reaching their culmination at the time of the Seven Years' War in an alliance of all the states (except England) which had developed from the Roman Empire—France, Spain, Austria, and Russia—and most of the New World; and later under Napoleon. With his defeat in 1815 ended the last continuation of the unity of medieval Christendom.[12]

Following the fall of Constantinople in 1453 Russia continued the tradition of the Eastern Roman Empire, developing a Byzantine-Slavic culture in direct continuation of the unity of the Christian Greco-Roman Empire, that lasted to the World War.

Modern Times: Unification Under the British Empire

Paralleling the Renaissance and the Spanish Empire there began the third period of inward pressure upon the Mediterranean—comparable to the invasion of the Roman Empire—disintegrating the unity of medieval Christendom. In 1453 the Turks captured Constantinople; crossed the Dardanelles gateway; commenced an invasion of Europe that was checked only at the Adriatic at Lepanto (1571) and by Austria and Poland in the seventeenth century; and drove a wedge between Russia and western Europe. In the sixteenth century came the separation of the Teutonic nations of the north in the movement known as the Protestant Reformation, which was checked in the Thirty Years' War (1618-1648) roughly at the old Roman Rhine-Danube barrier. Finally, in the sixteenth and seventeenth centuries England—the western anchor post of Mediterranean civilization—broke away from the unity of Christendom (Henry VIII; Elizabeth; Revolutions of 1648, 1688) and became the nucleus of modern or British-determined civilization. Again, as in the fifth century, defection of the western anchor post became the decisive factor in the eventual disintegration of the existing world unity.[13]

In the eighteenth century the center of influence shifted definitely to the north with the rise of the three northern states of Russia under Peter the Great, Prussia under the Great Elector, and England under the

[10] Wells, XXXII; Webster, V, VI; Belloc, VII; Haskins' *The Normans in European History.*
[11] Wells, XXXIV; Webster, VII-XI.
[12] Wells, XXXV-XXXVII; Webster, VII-XVII.
[13] Belloc, IX; Webster, VII; Wells, XXXIV.

Dutch and Hanoverian dynasties. The eighteenth and nineteenth centuries marked the growing strength and final supremacy of Slavic, Teutonic, and Anglo-Saxon influence, with corresponding decline of Mediterranean—a result comparable to the rise of the German and Frankish states after the fall of the Roman Empire. The twentieth century marked the completion of this inward pressure upon the Mediterranean.[14]

Rise of the British Empire—The English Revolution of 1688 established the supremacy of the ruling commercial oligarchy. In the long series of French wars (1688-1815) the supremacy of British sea power was secured. It extended into the Baltic to check or support Russia, and subsidize Prussia; gained control of the Atlantic, isolating France and building up the British empire and foreign trade; reached into the Mediterranean to gain Gibraltar; controlled the Sicilian pivot by alliance with Naples and occupation of Malta; utilized the Dardanelles gateway through friendly relations with Turkey; supported Savoy and Austria; and maintained naval control of the sea.[15] During the nineteenth century this sea supremacy was strengthened by the expansion of the British empire, industry, and commerce; checking of Russia in the Crimean War; virtual support of Prussian expansion in Europe to check France and Russia; support of Greece, Italy, and Turkey in the Mediterranean; occupation of the Suez Canal, Cyprus, and Egypt—bringing control of the Suez gateway and Egyptian anchor post; and the world-wide extension of British influence in government, commerce, literature, religion, science, and finance. In the twentieth century this position was consolidated by the Japanese alliance and the defeat of Russia in 1904-05; drawing of her two former enemies, France and Russia, into the British sphere of influence through the Entente; and virtual unification of world opinion under British leadership at the beginning of the World War. With the construction of the Suez Canal the Mediterranean had become the strategic center of the British Empire, with naval control of the strategic points. In the Entente and Allied nations England developed a world union centering on the Mediterranean axis comparable to the beginning of the Roman Empire under the Republic and of medieval Christendom in the eleventh century.[16]

The German Challenge.—This growing world unification was challenged by the Prussian-controlled German Empire, as was the similar unification of the Roman Empire and medieval Christendom by the Teutonic attacks of the fifth and sixteenth centuries. The World War may be regarded as the third revolt of the Teutonic nations against the unification of society under Mediterranean influence. With the weakening of France and Russia in the nineteenth and twentieth centuries Prussia was freed from dependence on England—as were the American colonies in 1763—and extended Teutonic influence to Austria-Hungary, Italy, the Balkan states, and Turkey—developing a German-dominated belt from the Baltic across the Constantinople gateway to the Suez gateway and the Egyptian anchor post, and the Gulf of Persia; cutting the Entente in two; isolating Russia; establishing contact with the great Mohammedan belt from the Gibraltar gateway to western China; and threatening Entente control of the land mass of Eurasia-Africa. In effect, it was the effort to replace traditional Mediterranean predominance by German *Kultur*.[17]

British Strategy.—The logical answer of England to this German threat, as to that of France previously, was the development of British sea power along the lines laid down by the younger and elder Pitt in the decisive struggles of the Seven Years' and Napoleonic wars: i.e., maintenance of the sea routes eastward from the English anchor post through the Baltic and Black Sea to Russia; cutting off Turkey at Constantinople; isolating Germany; and then crushing resistance by a combination of blockade and land power. The means was effective control of the sea routes by fleet supremacy, and of the passageways of the Baltic and Black Sea; then utilization of this control to encircle and crush Germany—*sea power over, on, and from the sea.*[18]

The World War.—Upon the declaration of war the British fleet obtained complete control of the main sea routes, permitting

[14] Webster XVIII-XIX; Wells XXXV-XXXIX.
[15] Mahan, *Influence of Sea Power*, 1660-1783; 1793-1812.
[16] Webster VIII-XIX; Wells XXXV-XXXIX.
[17] Belloc, *The Elements of the Great War*, parts I and II; Ferrero, *Europe's Fateful Hour*, II; Webster, XIX; Wells, XXXIX.
[18] Cf. Mahan, *Influence of Sea Power*, 1660-1783; 1793-1812.

blockade of Germany and utilization of French, British, and neutral resources. However, this was the limit attained by British sea power. In 1914 technical Dutch neutrality at the Scheldt prevented effective support of Antwerp, with loss of the strategic Belgian coast.[19] In 1915 the attempt to force the Dardanelles was deficient in organization and vigor; the gateway was occupied by Germany, and Russia was isolated.[20] In 1916, at Jutland, the British fleet failed to make effective use of its superiority, and the German fleet remained a "fleet in being" protecting the German coast, the Baltic, and the U-boat bases; while preventing a "close in" blockade and establishment of contact with Russia via the Baltic.[21] In 1917 the German U-boat campaign almost succeeded in cutting the vital Entente sea communications and was never really checked.[22] In 1918 it was only by American intervention that the Entente was saved from defeat.[23] As a result, England emerged from the war exhausted; with the nucleus of the ruling commercial oligarchy weakened and divided; effective sea power lost; and her hold on the strategic Mediterranean axis threatened. While the German revolt was crushed, the three northern powers of Russia, Prussia, and England came out of the struggle greatly weakened.[24]

Intervention of the United States.—In 1917 the United States intervened to prevent the collapse of civilization as did the Normans in the eleventh and France in the seventeenth centuries. The result was the collapse of Germany and American leadership in an exhausted world. At Versailles President Wilson largely dictated the peace; established a group of American-supported republics in central Europe; laid the foundations of world unity in the League of Nations; and promulgated a program of universal democracy backed by the resources of the American Republic—like Julius Caesar two thousand years before, a democratic dictator of a victorious republic presenting a vision of world unity.[25] Then, like Caesar, he was stricken at the moment of success; the American government withdrew from these ambitious plans; and the vision of world unity was left unrealized. However, under the Republican administrations American leadership has continued along more limited lines, with extension of influence in the New World, financial and moral support abroad, and encouragement of unity in such measures as the naval conferences of 1921 and 1930, the Kellogg Peace Treaties, and informal coöperation with the League of Nations. By 1930, the United States has assumed definite world leadership comparable to that of the Normans in the eleventh century in the unification of Christendom.

Threatened Collapse of Civilization.—Failure of England in 1915 to maintain contact with Russia resulted in the collapse of government there in 1917. In 1918 the defeat of Germany extended this collapse to the Central Powers. In 1919-20 withdrawal of American intervention undermined the resistance of the Entente, and, for a time, it seemed that organized government in the Old World might disintegrate, extending even to the New World. However, this was averted by economic and moral support from the United States, the stability of the British Empire, and the revival of the Catholic states in Europe. By 1930 Bolshevism has been limited to Russia.[26]

Stabilization of Civilization and the League of Nations.—At the present time the world has achieved temporary stabilization, with an approach to unification in the League of Nations and the various international agreements—resting largely on the supremacy of France, the British Empire, and the United States. The present problem is whether this unity can be consolidated, and, if so, under what predominant influence—or whether it will dissolve in a conflict of competing groups.

III. Sea Power and World Unity Today

The world today is in the same position it was in after the death of Julius Caesar two

[19] Churchill, vol. 1, XV.

[20] Frothingham, IX; Churchill, vol. 2; Nevinson, *The Dardanelles Campaign;* Gill, *Naval Power in the War, VI.*

[21] Gill, *What Happened at Jutland; Naval Power,* VII, VIII; Frothingham, XXIII; Churchill, 3, V, VI; Bellairs, *The Battle of Jutland* (Conclusion).

[22] Frothingham, XXX-216—"It is impossible for us to go on with the war if losses like this continue." (Admiral Jellicoe to Admiral Sims). Gill, IX, X.

[23] Frothingham, 209—"America thus became the decisive power in the war."—Ludendorf.

[24] Webster, XXX; XXXI: Wells, XXXIX.

[25] Cf. Churchill, *Aftermath.* (Caesar and the Emperors were leaders of the democratic party against the aristocratic Senate).

[26] Webster, XXXI; Wells, XL.

thousand years ago—civilization brought to the vision of administrative unity by a great democratic leader of a victorious republic; checked at the point of realization by his removal; and continuing nominally united, but actually dividing into natural divisions. The problem is whether nominal unity will develop into administrative unification as with the Roman Empire and (partially) medieval Christendom; or will break up into warring groups as did the empire of Alexander the Great after his death.

Nominally, the division is between almost complete unity in the League of Nations, with Russia and the United States nominally outside. *Practically,* the question is whether control shall rest with the Old World centered strategically at the Sicilian pivot, or with the United States at the Panama pivot. *Strategically,* the problem is whether sea power—supporting air power—can control the strategic Mediterranean axis (as did the British Empire) in addition to the ocean routes; or whether land power, working outward from the Mediterranean basin, can unify the Eurasian-African land mass, develop effective sea power, check the expansion of the United States, and develop administrative world unity.

The heart of the problem—strategically—is the Sicilian pivot. History has shown that whatever nation—Rome, Vandals and E. Goths, Eastern Roman Empire, Saracens, Normans, France, Spain, England, the Entente—controlled (not merely possessed) this point controlled the course of civilization. The lesson of geography and history is that he who controls the Sicilian pivot controls civilization.

(1) *The Nucleus of Unity.*—The first essential of unity is a nucleus able to establish unity, i.e., coördinate diverse elements into a common society. This was the function of Rome in the Roman Empire, of the papacy in medieval Christendom, of England in modern times. With the weakening of British leadership following the breakdown of British sea power in the World War, a new and stronger nucleus is necessary to develop nominal into complete world-wide unity.

Out of the World War conflict four such nuclei have developed with sufficient strength and leadership to secure this end:

(a) *The British Commonwealth of Nations:* drawing on the Dominions for strength as Rome did on the Provinces.

(b) *Russia:* the vigorous and powerful center of world discontent, dominating the interior of Eurasian-African land mass.

(c) *The United States:* the strongest single nation, continuing the traditions of British-dominated civilization.

(d) *The Traditional Mediterranean Civilization:* centered in France and Italy, dominant in western Europe and the League of Nations.

The British Commonwealth of Nations may experience such a revival, as the Roman Empire under Justinian, but the opportunity for supremacy offered in the World War is now passing to stronger hands. Russia may break loose in another outburst, but Bolshevism is too destructive of existing civilization to secure universal support.[27] Therefore, two nuclei remain strong enough to establish permanent unity: the *major cycle* of westward advance centering in the United States; the *minor cycle* of a temporary revival of the traditional Mediterranean civilization centering in France and/or Italy. Nature has established two natural strategic centers for world unity, each dominating its respective land mass—the Mediterranean centered at the Sicilian pivot—and the Panama Isthmus. Therefore, the Latin states controlling the Mediterranean and the United States controlling Panama constitute the two basic nuclei of world unity.

(2) *Effective Sea Power.*—World unity rests upon sea power uniting and penetrating the continental land masses. However, as world unity is entering upon a period of transition, so likewise is the technique of sea power—foreshadowed by German operations in the World War. This transition is summarized in three developments:

(a) *The new technique of sea warfare:* based on the internal-combustion engine and finding expression in the submarine, aircraft, and the *Ersatz Preussen* cruiser, combining the sea endurance of the sailing ship with the mobility of the galley.

(b) *Growing supremacy of destructive sea warfare:* resulting from the new technique of warfare and illustrated by the success of the German U-boats.

(c) *Increased land control of adjacent areas:* resting on technical developments in

[27] Cf. Gibbons, *The Red Napoleon.*

Courtesy "Lajas"

long-range gunfire, aircraft, mines, coastal submarines, motor boats, etc.

Practically, *sea power* is now being replaced by the still more effective instrument of *air power,* with the effectiveness of sea power depending on air control. Just as control of the sea gave superiority to inferior land forces (e.g., Athens, Rome, England); so now control of the air gives superiority to inferior sea forces and that to inferior land forces. The immediate result is to increase the effectiveness of land power within striking air distance of the land, while supremacy of sea power depends on the development of the fleet as a mobile base for air forces (e.g., through refueling). In addition, the secrecy, speed, and endurance of the submarine and new type cruiser expose communications and even naval units to dangerous attack. The present situation, therefore, is not unlike that at the fall of the Roman Empire with the rise of the new sea technique of the Vandal, Saxon, and Norse sea raiders; or in the sixteenth century with that of the English buccaneers under Drake and Hawkins. In other words, sea warfare is in a transitional period, weakening existing control of the sea, strengthening the land power of the land masses, and forcing a new conflict for sea supremacy.

(3) *Control of the Strategic Mediterranean Axis.*—In this critical period the Mediterranean basin assumes a strategic importance it has not had since the Roman Empire. It lies as a landlocked, protected, and self-sufficient fortress at the heart of the land mass of the Old World on the main route between the East and West, with gateways and outer bastions leading to all parts of the world. It is an ideal location for the outward expansion of a strong land-sea-air power controlling the strategic center at the Sicilian pivot. Its weakness lies in the ability of a strong naval power controlling one of the gateways and the Sicilian pivot—as the Vandals, Saracens, English—to break up this area into its natural divisions separated by the waterways.

The strength and the weakness of Panama is that it is simply a naval base. Its weakness lies in its highly artificial character, permitting strategic destruction by a single successful raid, its lack of land contacts, and its inability to serve as a political capital. It affords an ideal concentration point for a superior naval power, but even a temporary loss of sea supremacy may endanger sea power based upon it.

Of the two natural strategic centers for world unity the Mediterranean, therefore, is —strategically—the more important. It has that stability connected with the land which gave permanence to the unity of Rome and medieval Christendom as compared with the more brilliant but less permanent empires of Athens, Carthage, the Vandals, the Normans, and England based on sea power alone. Permanent world unity, therefore, must rest upon a firm control of the Mediterranean, either by an internal or external controlling nucleus. That control, in turn, depends upon the relative effectiveness of sea and land power.

IV. Conclusions

This study may be summed up in the following conclusions:

(1) The Mediterranean basin, centering at the Sicilian pivot, is the strategic center of world unity, with a secondary center at Panama.

(2) An approach to nominal world unity exists in the League of Nations and other international agreements, with the United States the dominant factor.

(3) The advance towards world unity has been marked by the ebb and flow of world influences inward and outward from the Mediterranean basin, with the Sicilian pivot the center.

(a) *Ancient World:* the inward advance of eastern culture followed by the outward expansion of Rome, culminating in the universal Roman Empire.

(b) *Medieval Period:* the inward pressure of Teutonic, Arabic, and Greek influence followed by the outward expansion of neo-Roman civilization, culminating in the unity of medieval Christendom.

(c) *Modern Times:* the inward pressure of Teutonic, Slavic, British, and American influence, with the World War marking a distinct revival of Mediterranean civilization.

(4) The final advance towards world unity is being determined by two major nuclei, each resting on a strategic center:

(a) *Mediterranean civilization*—centering in France and/or Italy—tending to control of the Mediterranean axis and unification of the Old World through the League of Nations.

(b) *The United States*—controlling the Panama pivot—tending to unification of the New World through the Monroe Doctrine and Pan-American union, and exerting a strong influence on the Old World.

(5) Dominance by the respective nuclei is determined by the effectiveness of sea power in relation to air power as compared with that of land power.

(a) Extension of American influence rests on the supremacy of sea power centering at Panama.

(b) Extension of Mediterranean influence rests on the ability of the Latin nations to check superior sea power and use their superior land power to effect unification of the Mediterranean basin and the Eurasian-African land mass, with the establishment of ultimate sea superiority.

(6) The momentum of sea supremacy developed by the British Empire gives immediate superiority to the major naval powers—England, United States, Japan—continuing the influence of British-determined modern civilization.

(British American, Japanese sea power resting on battleship supremacy controls and penetrates the continental land masses.)[28]

(7) Continued developments in the new technique of warfare—submarines, aircraft, *Ersatz Preussen* type cruisers, long-range artillery, aircraft, mines, etc.—tend to increasing effectiveness of the Latin powers:

(a) *Potential control of Mediterranean:* Spain at the Gibraltar straits; Italy at the Sicilian pivot; Greece at the Aegean and Dardanelles; Italian land power at Egypt and Suez.

(b) *Potential control of western Europe:* French and Little Entente control; French air threat to England; Italian dominance in Mediterranean.

(c) *Threat of destructive sea warfare:* control of Mediterranean; French submarine and cruiser forces; coöperation with Latin America.

Conclusion.—The present situation in the new technique of warfare—sea, land, air—is such as gives a growing advantage to the Latin states, France and Italy, and permits them to use a combination of land-sea-air force to establish control of the strategic Mediterranean basin, of Western Europe, of the Eurasian-African land mass, and of communications with Latin-America. This strategic position coincides with the League of Nations and tends to administrative unification under Latin control of that organization. A single Latin nucleus, Italy and/or France, would be in a strong strategic position to develop nominal into actual world unity.

Looking at the problem from the American point of view the conclusion may be summed up as follows:

(1) Three essentials are necessary to world unity.

(a) A central nucleus able to establish unity.

(b) Effective sea power.

(c) Control of the Mediterranean axis.

(2) Unification of the Latin states, France and Italy, would develop, under existing technical conditions, a strong central nucleus having effective sea power and control of the Mediterranean axis.

(3) An effective Latin nucleus working outward from the Mediterranean through the League of Nations would be in a strong strategic position to dominate the Eurasian-African land mass, replace Bolshevism in Russia by a favorable conservative government, affiliate with Latin and perhaps British America, and isolate the United States.

Therefore, continuance of American supremacy and the extension of American institutions depend upon the following conditions:

(a) *Development of effective sea power,* i.e., such mastery of the new technique of sea warfare as permits effective control of the sea routes, e.g., combination of sea and air power through refueling operations.

(b) *Control of the Mediterranean axis,* actually or potentially, in one of the following ways: *support of England* to reënforce British naval control of the Mediterranean; or *support of the Mediterranean powers*—Spain or Italy—to permit effective intervention of American sea power in this strategic area.

Completion of world unity depends upon the effectiveness of American sea power.

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THE EBB AND FLOW OF WESTERN CIVILIZATION BASED ON SICILIAN PIVOT

Empire	*Base*	*Limit of Advance*	*Decisive Action*	*Withdrawal Date*	*Remarks*
		THE ANCIENT WORLD			
		Inward Advance from Asia Minor			
Persia	Tigris	Aegean	Salamis	480 B.C.	Xerxes
Greece	Aegean	Sicily	Syracuse	413	Athens
		So. Italy	Various	275	Pyrrhus
Carthage	Tunis	Sicily	Aegetian Is.	241	First Punic War
		Spain	Zama	202	Hannibal
		Outward Expansion of Roman Empire			
Rome	Italy	Elbe Dneister Caucasus Persian Gulf	Gradual withdrawal	117 A.D.	Trajan
		THE MEDIEVAL WORLD			
		Inward Invasion of Roman Empire			
Vandals	Baltic	Sicily-Tunis		534	(Justinian)
E. Goths	Danube	Sicily		535	(Justinian)
Franks	Rhine	Rome		814	Charlemagne
Normans	Seine	Sicily		1268	Died out
E. R. Emp.	Constantinople	Sicily		827	(Saracens)
Saracens	Syria	So. France	Tours	732	W. Franks
		Sicily		1031	(Normans)
		Constantinople	Constantinople	717	Leo the III
		Outward Expansion of Medieval Christendom			
Medieval Christendom	Rome	Palestine	Jerusalem	1187	Crusades
		Constantinople		1261	Crusades
		Greenland		16th Cent.	(Norse)
		Dneister		17th Cent.	Poland
Spain	Spain	England	S. Armada	1588	Elizabeth
		Baltic	30 Years War	1648	H. R. Empire
		S. America		19th Cent.	Monroe Doct.
		MODERN TIMES			
		Inward Pressure on Mediterranean			
Turkey	Constantinople	Adriatic	Lepanto	1571	(Spain)
France	France	Egypt	Nile	1798	Napoleon
Russia	Baltic	Balkans	T. Berlin	1878	(Bismarck)
Germany	Baltic	Suez	Various	1915	World War
England	England	Constantinople	Dardanelles	1915	World War
		Suez	——	——	Now held
Italy	Piedmont	Sicily	Various	——	(1860-1870)

		Outward Expansion			
Italy	Italy	Lybia-Rhodes	Turkish War	——	(1912)

CONTROL OF SICILIAN PIVOT IN RELATION TO WORLD UNITY

Dominant Civilization	*Controlling Sicily*	*From*	*To*	*Conquered By*
Asiatic	Carthage[1]	750 B.C.	241 B.C.	Rome
Greek	Greeks[1]	750	241	Rome
Roman	Rome	241	493 A.D.	E. Goths
None	E. Goths[2]	493 A.D.	535	E. Roman Empire
E. Roman	E. R. Empr.	535	827	Saracens
Saracen	Saracens	827	1031	Normans
Norman-Papal	Normans	1031	1268	Anjou (France)
French	France	1268	1282	Revolt
French	Independent	1282	1409	Spain
Spanish	Spain	1409	1713	T. Utrecht-Eng.
French-English	Savoy[3]	1713	1720	Treaty
French-English	Austria	1720	1738	Treaty
English	Naples	1738	1860	Treaty
English	Italy	1860	——	Garibaldi

[1] Conflict between Greeks and Carthage.
[2] Period of anarchy following Vandal invasion early fifth century with Vandal raids on Sicily.
[3] Period of British-French wars with British naval control of Mediterranean and control of Sicily by allies. After 1800, Sicily dominated by British control of Malta.

Riding *a* Hobby

By the late LIEUTENANT (J. G.) HARRY WAGNER, *U. S. Navy**

ALL of us, it is hoped, indulge in some form of athletic activity whereby we are kept in physical trim. For some it is golf, for others tennis, walking, swimming, or innumerable other activities. But what manner of mental exercise do we take during long cruises, during those periods of inaction at some unexciting outport or during those evenings when social activities are at their lowest ebb. So often have we heard the plaint that there is nothing to do in this or that hopeless place that it is thought some ideas may be offered which might serve as a diversion during such intervals.

Many times most of us have resolved that some day we would take up a branch of work outside of our professional interests. This work would lead us into various fields and might after an interval excite such curiosity that our search for stamps, curios, antiques, old ship models, or even a remote field of learning would turn out to be an interesting subprofession. However, owing to the great demands which parties, bridge, and other social activities have exerted we have put off the day of beginning this research. During our unemployed periods we have been too busy sitting around the wardroom table "blowing off steam" to think of starting. Now, blowing off steam with all sorts of interesting messmates is in itself a very excellent, enjoyable, and educational pastime but when indulged to excess is apt to lose its educational and even to some extent its enjoyable qualities.

Among the first pursuits to occupy these spare moments there might be mentioned a subject that is not, strictly speaking, a hobby. It is the study of some particular branch of the naval profession with the idea of specializing. This most certainly should be done as it affords a broader point of interest in our work as a whole. But unless a person is a genius for extensive research this alone is not satisfactory.

Perhaps the easiest hobby for which the most facilities are afforded is that of reading. In this the most difficult achievement is to strike a proper balance between lighter stuff and material of a more serious nature. There are any number of magazines which owe their present popularity to series of innocuous stories well told, leaving the reader no better or no worse than at the start. Certainly a proportion of this is necessary for it is impossible for a man of action to indulge wholly in serious reading. At the same time there are a large number of magazines written in a lighter vein which endeavor in a pleasant way to broaden the reader's horizon and keep him informed of present-day events, thoughts, and tendencies. Undoubtedly partial indulgence in these magazines would broaden the outlook and present openings for still more serious reading. At any rate, they will enable the reader to pass some of his spare time in an instructive fashion and give him a glimpse of the larger world outside the Navy.

Perhaps the reader does not have to go to the extent of finding the subject in which he is vitally interested. Almost any subject will be a trifle difficult at first but further reading presents greater problems with a heightened interest. Mayhap the subject is already known but the reader is baffled as to the correct method of starting his research work, the best book to obtain. Here is where special agencies are ready to help him. The Bureau of Navigation, as everybody knows, maintains a circulating library open to all officers for the asking. The American Library Association publishes pamphlets in the "Reading with a Purpose" series. To simplify matters for the reader these pamphlets group books in economics, philosophy, history, international relations, music, painting, and various other branches of study. A great many of the public libraries in the larger cities have engaged staff experts to improvise reading courses

* Lieutenant Wagner died October 27, 1929.

to suit the tastes of the individual; it should be possible to take advantage of this facility when in or near a large metropolis.

Perhaps the reader has a special inclination toward history through a natural liking for picturesque and adventurous events. The tramp of armies, naval battles from days long gone by—their telling exerts an almost irresistible fascination for all. Through such events one is led to understand the reason for it all: trade rivalries, the desire for fertile territory, conflicts of policy, racial and economical expansion, and innumerable others. If, as so many claim, history repeats itself, the reader is moved to many conjectures concerning the future. It all opens up fascinating possibilities ranging from the magnificent day dreams of a Wells to the pessimism of a Spengler. At first many of the leaps history takes seem fantastic but after a short while the reader begins to draw the tangled skeins together, begins to understand that very much the same desires animate all mankind. To realize, make allowances for, and to foresee the results of, these desires are very much within the province of all in the naval service.

Perhaps the reader has a flair for natural history. There are any number of interesting and readable books which help to develop such a tendency. Beebe and Roy Chapman Andrews may lead to further study. With the manifold opportunities a naval officer has in his travels to out-of-the-way places a talent for investigation in this direction could be embraced much more easily than is possible for the average civilian. True enough, our life tends to develop the practical rather than the scientific side but the spirit of science cannot be quenched in a true devotee.

Every naval man should have traveled extensively before finishing his career; however, if there is any spot on the face of the earth he has not visited (there usually are a few) he should be able to say he has been there and "get away with it" to boot. Everyone is a traveler at heart—if he does not do his traveling actually he likes to do it vicariously. Catering to this predisposition are any number of excellent magazines and books. Perhaps the reader will take Halliburton's stories and live through them himself, perhaps digest every volume of Lucas's *Wanderer* series, perhaps pore over every volume of the *National Geographic*. If so, it will be found a very pleasant pastime, rendering the places studied much more interesting when visited. Even if never visited in reality it will be always possible to say, "Well, now, when I was in Agra."

Undoubtedly the "hobbyist" once started will want to follow out some systematic course of reading, slight or comprehensive as the fancy dictates. A more pleasant but usually less thorough method than the scientific and efficient system is to read the things one is in the mood for at the time. However, the general tendency when the matter is left to choice and mood is to stress the more interesting and fascinating to the exclusion of the less attractive but still essential parts. The choices are so many that the individual must take his pick. Book clubs of all sorts and fifteen-minutes-a-day clubs abound in this speedy age. Perhaps there are some who would still prefer to browse around the bookshops with the hope of enjoying their reading in a pleasanter, more leisurely, but less scientific manner. But this method has the fault of requiring a greater effort toward a proper balance.

A very enlightening branch of reading which the naval man may take up and which will serve him during his career is the study of international relations. This country as a whole may seem to be clinging despairingly to the old isolationist policy but whether we will or no we are rapidly being drawn into more binding relationships with other countries. With our constantly expanding foreign trade, our goods permeating every country of the globe, our interests extending to every corner of the world, it is inevitable that our dealings with other governments will multiply. In the forefront of such dealings are always the diplomatic official and many times the naval officer. Problems in connection with these relationships will always arise, growing more numerous as our trade expands. Often as in days past the naval officer on the spot will be charged with the solution of the problem. Aside from a purely expedient viewpoint the reader may desire to acquaint himself with the various policies of different nations in order to keep more fully informed of the trend of world events. The average citizen and still more the average naval officer should consider it a duty to understand questions of policy, national interests, and the aspirations of the nations of the world.

Paul Scott Mowrer in *Our Foreign Affairs* tells a good and very logical means for a thorough and accurate study of foreign relationships. At the risk of repeating a great many things he has brought forth in his volume it would be advisable to (a) make a study of each country separately, keeping a notebook in which is written the national policies, racial outlook, strategic position, strength and condition of army and navy, economic outlook, industrial and agricultural wealth, maritime trade, form of government, quality of diplomatic service, and innumerable other items which will present themselves; (b) subscribe to reputable magazines and newspapers which interest themselves in current affairs and, more especially, maintain a good foreign news service; and (c) cull over all of these, inserting in one's notebook for future reference the items of paramount interest and applying especially to a particular situation.

A naval man particularly has an excellent opportunity for the study of foreign affairs at first hand. How many of us have made the best use of our chances while on foreign duty to converse with diplomats and others having a part in the control of the destinies of nations? How many of us have made use of our opportunities? Such contacts with diplomats are easily accomplished and often very valuable.

Perhaps one of the simplest methods of choosing a hobby is merely to pick up the average magazine, turn to the advertising pages and gaze at the florid advertisements put forth by the extension universities and numerous other correspondence schools. One may select anything from being a veterinary surgeon to a student of ancient folk lore. After all it is not the direct material gain for which we are searching in the selection of this hobby of ours. It is an abiding interest in some one subject exclusive of our profession and an adequate sense of satisfaction in having undertaken a job which even a life time will not complete.

The possibilities of reading are not exhausted, but for a brief outline such as this it would be best to shift now to the amateur writer. No doubt every person of average education who has had a fair amount of the world's interesting experiences aspires to write. A great many actually do sit down to the task of writing an article or book concerning their experiences or ideas and sometimes these are published. But whether the amateur writer ever has his material published or not, writing is a pleasant hobby which will take a great deal of one's spare time. (It's a lot of work, too).

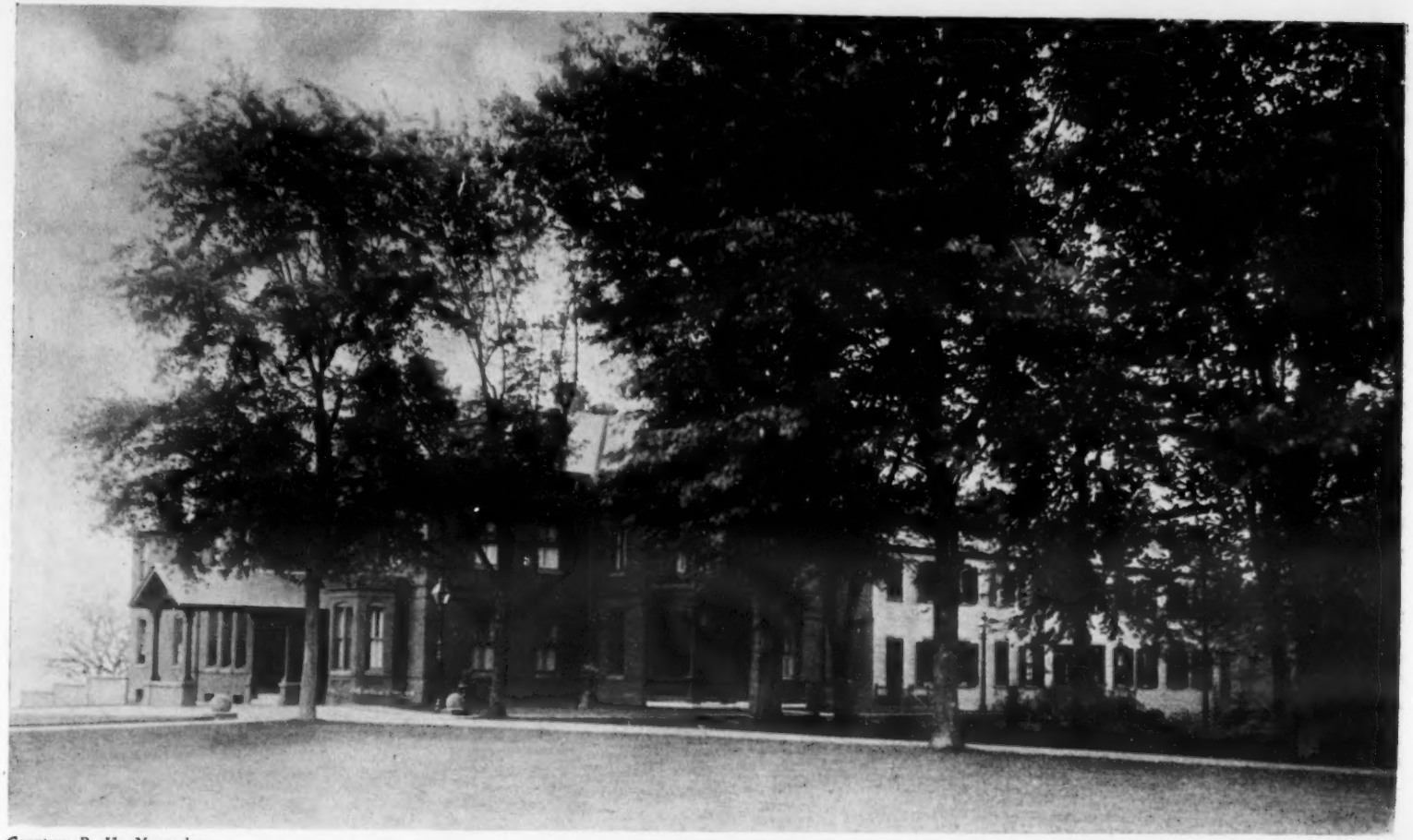
The Navy needs today more than ever before writers who can depict its life interestingly to the people. Some of our writers have been read quite widely but not nearly so much so as some of those of foreign navies. The average civilian gets glimpses of us only while on parade and at social functions; of our real workaday life little is seen or known. A good market is open for the writer who can present his subject appealing to our people.

Music has its devotees by the score. Although fervently hoped that such is not the case, the belief is general that every ship has the unmitigated pest—the very, very amateurish saxophone player. The only place for such a person is in the middle of a large open field miles from nowhere. However, there is always room on board ship for many more of those who have passed the painful stage of their musical education. It is possible to estimate the value of these people in heightening the morale of a ship and increasing its general contentment. The person who can play well one or more instruments and can devise various songs in addition furnishes many happy hours for all hands. But here we are concerned for the most part with those of us who do not possess a talent for the playing of any instrument. Starting with dance music and light instrumentations it is very easy to work up an interest in all manner of music; it is possible to enjoy this in all ports of the world. Most cities have excellent dance orchestras, fine civic operas, and rather good symphony orchestras. It is possible to find a happy medium between the lighter and more serious vein. From pure enjoyment of the music one progresses to intellectual appreciation of the world's finest symphonies. Even on board ship it is possible to cultivate this taste through the phonograph or radio.

There are innumerable other hobbies ready for cultivation. This paper has attempted merely to present a few that may interest our profession. It is worth while intellectually and professionally. Ride a hobby and forget that there is nothing to do in this port.

Courtesy P. H. Magruder

MAIN GATE, NAVAL ACADEMY, 1898
The Spanish "prisoners" passed daily through this gate.



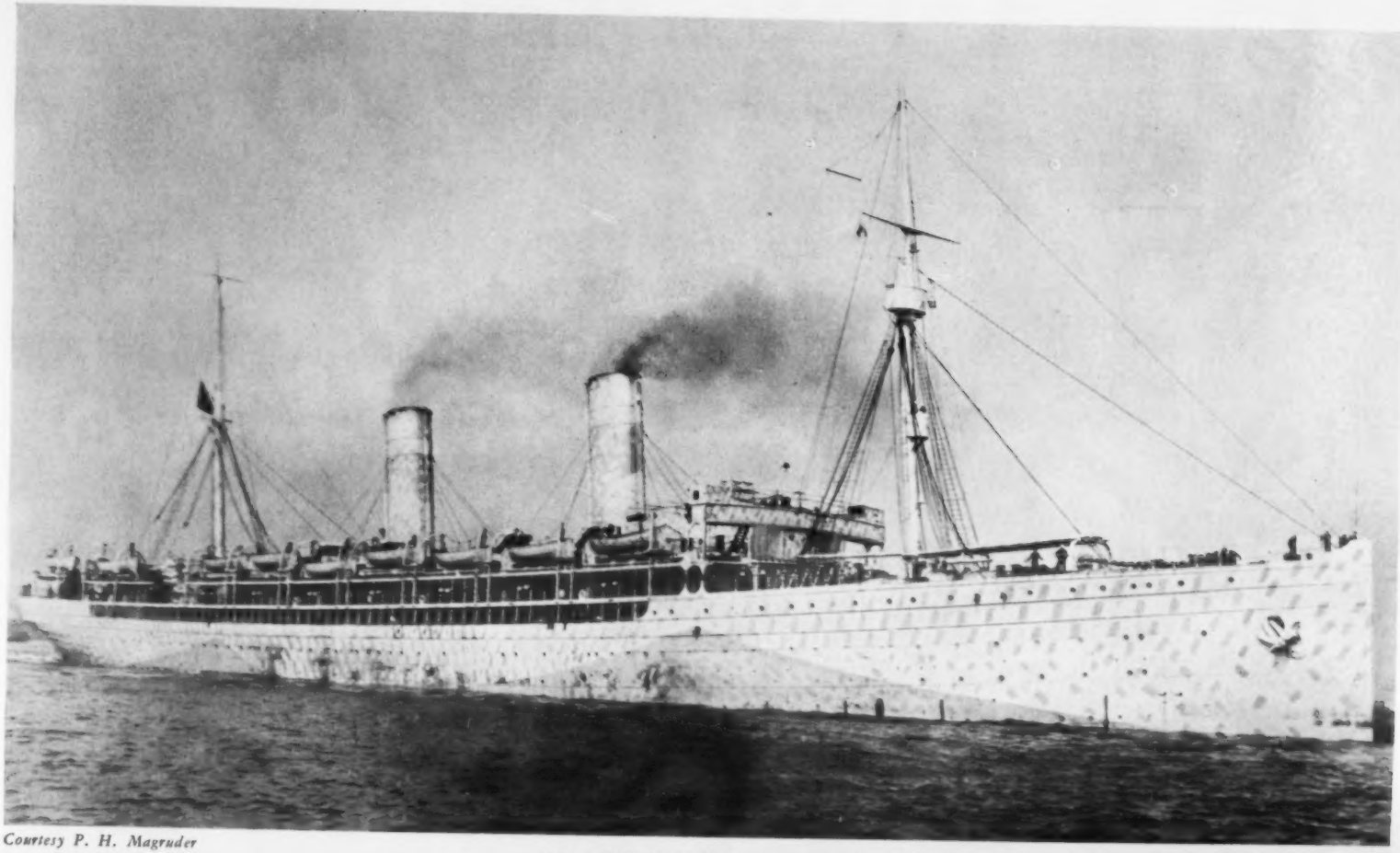
Courtesy P. H. Magruder

OLD BUCHANAN ROW

The residence of the superintendent, Admiral McNair, to the left, and that occupied by Admiral Cervera to the right.

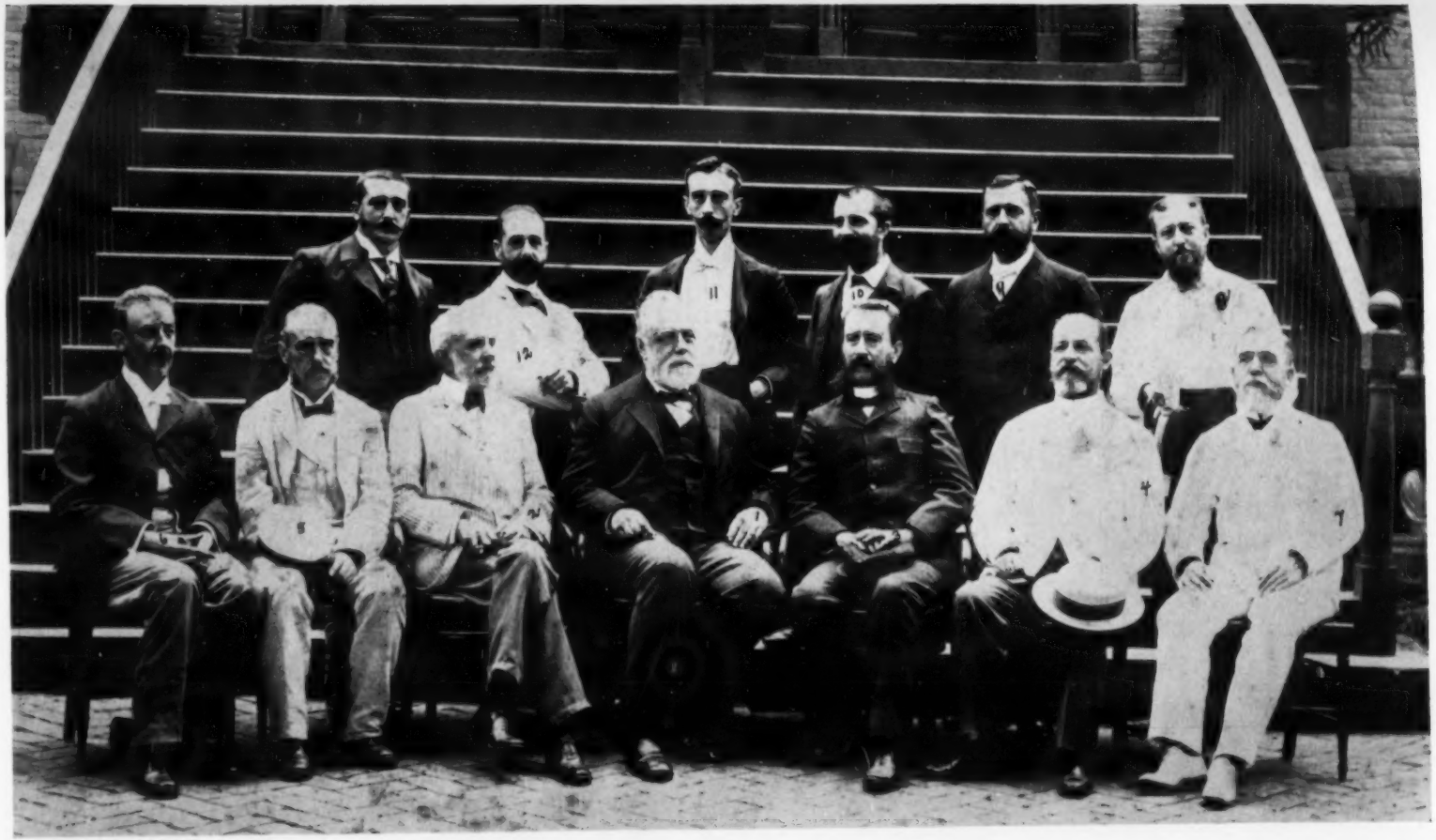
Courtesy P. H. Magruder

OLD STRIBLING ROW, NAVAL ACADEMY, 1898
The junior Spanish "prisoners" of war were quartered here.



Courtesy P. H. Magruder

U.S. AUXILIARY CRUISER *ST. LOUIS*
This ship brought Admiral Cervera and the first detachment of "prisoners" to Annapolis



Courtesy P. H. Magruder

ADMIRAL CERVERA AND STAFF AT NAVAL ACADEMY, 1898

Left to right (sitting): Lieut. Comdr. Carlier, Lieut. Comdr. MacCrohon, Commodore Parades, Admiral Cervera, Captain Eulate, Comdr. Roldan, Lieut. Comdr. Vazquez.

Left to right (standing): Lieut. Comdr. Aznar, Lieut. Comdr. Marina, Lieut. Imaz, Lieut. Cervera, Lieut. Comdr. Quiroga, Lieut. Comdr. Llamos.

UNIV. OF MICH.

Courtesy P. H. Magruder

SPANISH "PRISONERS" OF WAR, NAVAL ACADEMY, 1898

Courtesy P. H. Magruder

SPANISH OFFICERS, NAVAL ACADEMY, 1898

The group was taken on the occasion of Cardinal Gibbons' visit to Admiral Cervera.

Left to right (sitting): Commodore Parades, Father Kautz, Cardinal Gibbons, Admiral Cervera, Captain Eulate.
Left to right (standing): Lieut. Ceron, Lieut. Pabil, Lieut. Cavanillas, Lieut. Cervera, name not known, Lieut. Comdr. Carlier, Comdr. Roldan, Father Currier, Lieut. Comdr. Marina, Chaplain Martinez, Lieut. Manjon.

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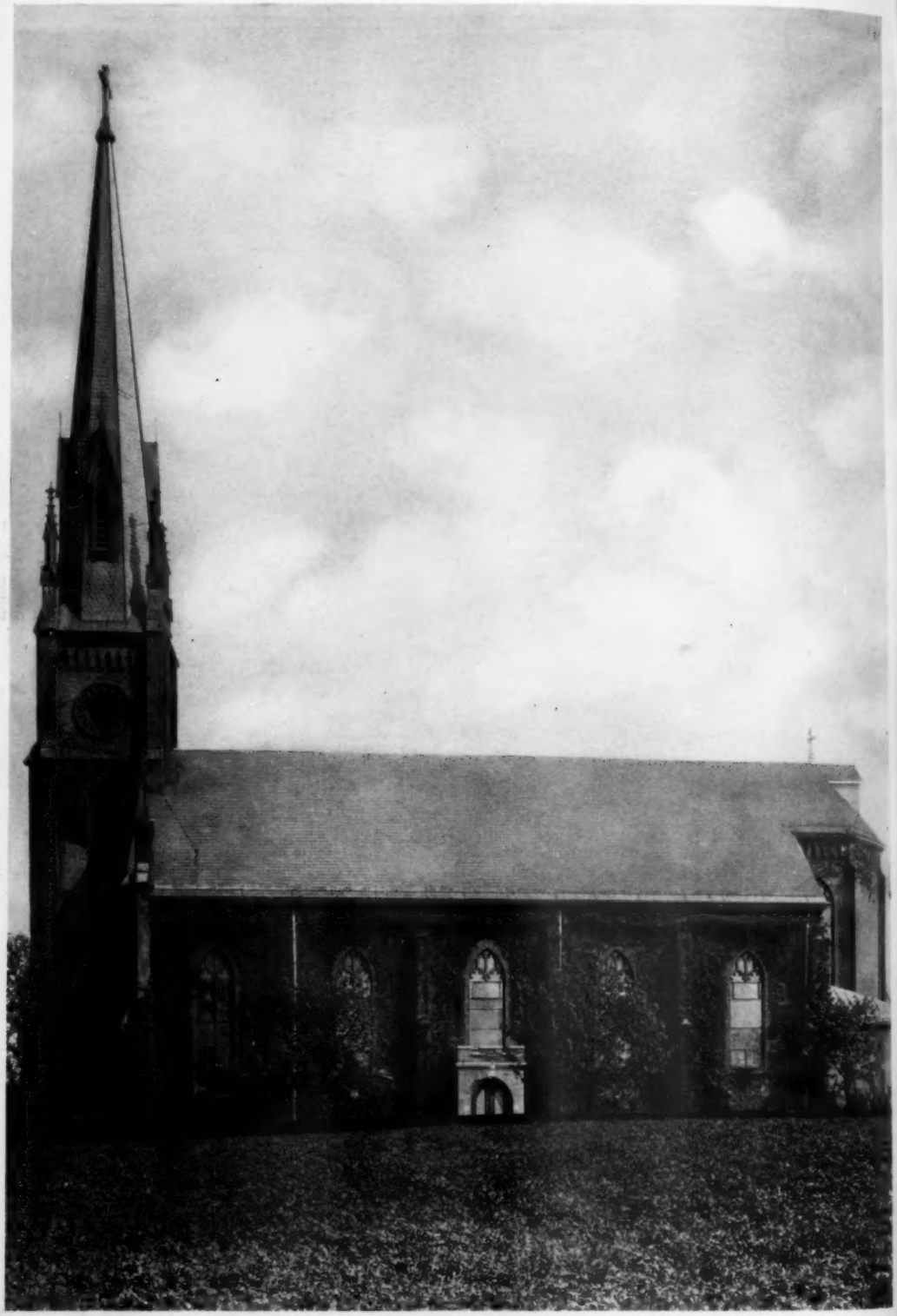


Courtesy P. H. Magruder

ST. MARY'S CHURCH, ANNAPOLIS

The shrine of the Spanish "prisoners" of war, which they visited each day.

The Spanish Naval Prisoners *of* War *at* Annapolis, 1898

By P. H. MAGRUDER, *Secretary, U. S. Naval Academy*

A narrative of personal association with the incident; with impressions, viewpoints, and expressions of feeling at the time.

ON THE morning of July 4, 1898, the American press heralded to the world the following famous message from Rear Admiral William T. Sampson, U. S. Navy, commander in chief of the American Naval Forces operating in Cuban waters:

Secretary of the Navy, Washington, July 3, 1898

The fleet under my command offers the nation as a Fourth of July present the whole of Cervera's fleet. It attempted to escape at nine-thirty this morning. At two the last ship, the *Cristobal Colon*, had run ashore seventy-five miles west of Santiago and hauled down her colors. The *Infanta Maria Teresa, Oquendo*, and *Viscaya* were forced ashore, burned and blown up within twenty miles of Santiago. The *Furor* and *Pluton* were destroyed within four miles of the port.

SAMPSON

There was much discussion in naval circles and elsewhere as to what our government should do with the captured Spaniards, and speculations were rife as to where they should be imprisoned. It was decided by the Navy Department that all officers should be sent to the Naval Academy and all sailors to Seaveyes Island, Portsmouth, New Hampshire.

On July 8, Captain P. H. Cooper, U. S. Navy, then superintendent, received a telegraphic message from the Navy Department as follows:

Washington, D.C., July 8, 1898,
Naval Academy,
Annapolis, Md.

The Spanish officers that surrendered to Sampson will be quartered at Annapolis. Senior officers in the bachelor quarters, and if there is not room enough for all, juniors in the cadet quarters. *Harvard* should arrive at Portsmouth, New Hampshire, today. After landing men Seaveyes Island will come to Annapolis with officers. Make necessary arrangements.

CROWNINSHIELD

Immediate preparations were begun to receive the Spanish prisoners of war. Admiral Cervera, his personal staff, and all senior and commanding officers were to be quartered in old Buchanan Row in one of the most comfortable houses in the yard, always assigned to a senior member of the Academic Board. The junior officers were to be assigned quarters in the lower cadet buildings in old Stribling Row, with meals served in the old mess hall. Every comfort and pleasure was planned to make their stay as agreeable as possible under the circumstances; in other words they were to be treated almost as guests of the nation rather than as prisoners of war, a new departure in the world's history as to the manner of treatment of prisoners of war and a crushed and fallen foe.

In accordance with the prearranged plan for their reception, Contra Almirante (Rear Admiral) Senor Don Pascual Cervera y Topete, with forty-five other Spanish naval officers and their servants who had been captured, were landed from the *St. Louis* as prisoners of war at the Naval Academy dock. This was, perhaps, the first time since the British and Hessians were marched before Fort Frederick in Washington County, nearly a century and a quarter before, that any body of foreign prisoners of war had landed in the state of Maryland. This event naturally created considerable interest, especially as most of the prisoners were of high official rank and members of aristocratic families in Spain. Their courage under misfortune commanded the highest consideration from the Annapolis people during their enforced stay, and they were treated with courtesy and respect.

A little after three o'clock in the afternoon of July 16, the smoke of the big auxiliary cruiser was seen over Tolley's Point. In ten minutes she signaled to the *Santee*. The latter was flying the flag of Rear Admiral McNair, who had just taken over his new command, having relieved Captain Cooper on July 15, the previous day. The station tug *Standish* immediately went out to the *St. Louis* with Lieutenant W. S. Benson (now rear admiral, retired) in command. Lieutenant Benson carried with him blank paroles for the prisoners to sign before they landed. This parole was printed in English and Spanish, and both copies were supposed to be signed. It was as follows:

I do pledge my word of honor that during the period of my retention at the United States Naval Academy as a prisoner of war, I will not go beyond such limits as may be prescribed by the superintendent of the Naval Academy, and freely agree to abide by such regulations as said superintendent may from time to time establish. The limits now established will be the grounds of the Naval Academy and the City of Annapolis from eight o'clock until sundown.

It took about forty minutes to transfer the prisoners and their few possessions from the *St. Louis* to the *Standish*. In the entire party there were not more than a dozen small trunks, very un-American in appearance, showing in a pathetic way that the unfortunate men had escaped from their battered and burning ships with their lives only. They took leave of Captain Goodrich with courtesy, and thanked him for his kind treatment during their stay on board.

The *Standish* reached the wharf at about 5:15 P.M. The Academy gates had been closed and few were in the grounds except residents and employees. All others were excluded from the wharf and from the approach to it during the landing. There were, however, a number of ladies and others in the Naval Academy Club house and nearby buildings, who viewed the strange procession as it passed, without themselves being seen. When the *Standish* came alongside the wharf, the commandant of cadets, Captain Edwin White, was there to receive the party. Major Muse had a guard of marines drawn up and they presented arms as the Spanish officers stepped ashore. The reception to Cervera was in all respects a rear admiral's reception, except that no salute was fired. After Captain White, who was second in command to Admiral McNair and representing him on this occasion, had received the prisoners, he invited Admiral Cervera, his son, Lieutenant Angel Cervera, and Commodore Jose Parades into the carriage of the superintendent, and together they drove to Admiral McNair's office. Here they were courteously received and after some little conversation they were escorted to their quarters at 17 Buchanan Row. Admiral Cervera found his parlor and dining rooms delightfully fragrant with beautiful flowers with which the tables and mantelpieces had been decorated.

In the meantime an unpleasant "hitch" had occurred at the *Santee's* wharf. The prisoners had refused to sign the paroles unless advised and directed by Admiral Cervera. The admiral himself had waved aside the parole with the remark that he would give his word of honor and of course that would be sufficient. When this unexpected obstacle occurred, messengers were despatched to Cervera, but he declined to advise his officers to do any different from what he had done. They could do as they pleased, said he. When the reply came back it did not mend matters. Captain White and Commodore Parades went down carrying on a conversation as they went. The commodore stopped at short intervals to gesticulate like a foreigner.

The commodore argued strongly, it is said, for a verbal parole, but this was not acceptable and he finally persuaded all his fellow captives to sign the papers except Captain Antonio Eulate, the captain of the *Viscaya*. That gallant officer held out, saying that he did not see why a verbal pledge was sufficient for the admiral—"My word is as good as the admiral's." The result of this refusal was that Captain Eulate was required to remain within the Naval Academy enclosure.

After seven o'clock the prisoners marched to their quarters, which were not more than a hundred yards from the wharf. Three of them, sick or badly wounded, had to be carried to their quarters on stretchers by bluejackets.

After the prisoners were delivered at the Naval Academy, they expressed their great surprise and pleasure at this unique reception. On arrival they had been naturally morose and despondent in their sad plight, but as soon as they realized these more pleasant conditions they became cheery and

most respectful. One officer stated that they expected to be placed in prison or cells, a fate they would have expected from other nations under similar circumstances. So the United States was the first nation to show such a kindly and humane spirit, and set an example as to how a crushed foe should be treated. This feeling was greatly appreciated by the prisoners, as they appeared to be happy and contented and gave no trouble. They were always respectful and courteous and were anxious to observe the regulations. It was noticed about the grounds at colors that they stood at attention.

On July 20, the U.S.S. *Harvard* brought from Portsmouth, New Hampshire, thirty-four more prisoners. They were quartered with the others, but the next day this detachment was removed to the upper cadet quarters and quarantined until August 12, because yellow fever was reported among the prisoners at Portsmouth.

An unfortunate incident occurred on board the U.S.S. *Harvard* which greatly depressed the admiral and his officers. The night before the *Harvard* sailed six Spanish seamen were killed and many others badly wounded. For some tragic, unexplainable reason, these men were fired upon by soldiers placed on board the *Harvard* as guards. The reason for this act was never clearly made known. Admiral Cervera felt that the lives of six innocent men had been taken away and that the incident should always be considered one of a most serious character, because his officers and men were harmless prisoners of war. He felt that steps should be taken to have an investigation of this sad event. He was keenly sensitive, because his men had at all times acted in an honorable and respectful manner. He could not understand why they were so "foolishly" treated because he knew by his association with them that there could have been no condition of mutiny—only a misunderstanding of some kind. He brought the matter to the attention of the Secretary of the Navy, who assured him the Department would, as soon as practicable, have an investigation in the premises by the Secretary of the State, as the soldiers who did the firing were in Cuba and he would be duly notified as soon as witnesses could be summoned.

A Spanish officer on board the *Harvard* at the time stated that the tragic affair was due to the fact that the sailor prisoners were segregated in the after part of the ship and were guarded by Massachusetts Volunteers (9th Massachusetts Regiment). At about 11:30 P.M. on the night of July 4, one of the prisoners passed over the indicated line. The sentry ordered him to go back but in some way he showed resistance, and the sentry fired. The noise awakened the other six hundred corraled prisoners, who apparently thought that it was an explosion, and they jumped to their feet greatly excited. The watch, who were under arms, ordered the men to sit down, and as they did not promptly obey, they fired a volley which resulted in the killing of six sailors and wounded others, also causing several to jump overboard. The latter were picked up by the ship's boats. It was claimed that the disregard of the first order of the sentry and then later that of the watch was due to their ignorance of the language, and had it been composed of soldiers of the regular Army instead of volunteers, this sad fatality certainly would not have occurred.

The arrangements for the landing of the remaining thirty-four prisoners from the *Harvard* on July 20 were similar in detail to those from the *St. Louis*, which completed the full complement of officer-survivors of the battle.

The Spanish officers were as a whole a handsome set of men, dark skinned and sunburned, with bright, brown eyes and radiant features, but they gave every sign of the terrible ordeal to which they had been exposed. It must be remembered that they escaped, most of them, by swimming from their burning and exploding ships, after undergoing a bombardment which destroyed nearly one-half of their original number, and from the like of which few men have ever escaped to tell the tale. Their clothes were in bad shape. Most of them wore their blue uniform coats, elaborately decorated with lace, and white caps and trousers. Some of them had on full suits of white. They carried themselves as men weary and dispirited.

While a prisoner of war at Annapolis, Admiral Cervera set a fine example of splendid spirit, and of cheerful and kindly feeling to his brother officers by his many manly acts, showing how a vanquished hero could proudly hold high his head. It had been a

step from Santiago to the sea, and yet in taking that step Cervera had stumbled and fallen—and great was the fall. It was his habit to stroll along the slopes of the Severn, a silent man. He was not morose. He did not murmur; he was a proud prisoner.

In his daily walks about Annapolis he seemed like a man at liberty. He at least knew better. He felt about him the keen strength of unseen silken threads, checking him if he should walk abroad beyond the point of time. Like Josephine at Malmaison, Napoleon on his iron-bound island, Hortenz within the prison walls of the Alps, Jefferson Davis within the casements of Fortress Monroe, Lee under the lindens of Lexington—like the leaders of all lost causes in all times—Cervera kept his smile for men who come and go, and his desolation for himself. He moved in an envelope of pathos. About him was an armor as invisible as it was impenetrable—like that of Brunhilde's knight—not, happily, like the armor of his own cherished *Maria Teresa, Viscaya, Oquendo,* and *Cristobal Colon.*

All Americans feel a closeness to what is called a fair and square man. So it was that the good folk of Annapolis with the echoes of the voice of Washington still heard from the State House on the hill, looked with some sort of kindness upon the stricken man of Santiago, who bade Hobson, indeed, to be of good cheer, but spared not himself in the sea fight.

Cervera was full six feet tall; his legs were long with an unusual gait. They did not look as if they were used to walking. A man who did not appear stout, although he weighed easily over two hundred pounds. In his daily walks around the Naval Academy and Annapolis, he dressed in a citizen's sack suit, an inexpensive suit of blue, and carried an umbrella.

Admiral Cervera's first voluntary act after his arrival at Annapolis was to attend mass at St. Mary's Catholic Church. He reached Annapolis Saturday night and attended early mass Sunday. Indeed, he spent most of his time in devotion, and fought his battles upon the troubled waters of his own heart; in the end he looked like a man who had won his fight.

One morning as he passed through the barred gates of the Academy grounds, a woman stood far down the street; she was talking earnestly to her little girl, coaching her how to speak to the Spanish admiral who was approaching her with his awkward, swinging gait. The mother had coached the girl well.

"Good morning, Admiral Cervera," exclaimed the little tot. The big Spaniard bent down deliberately and swung the little child clear from the ground and pressed his lips to her forehead—the Spanish way of greeting. Then he went on with a grim smile.

Admiral Cervera was a constant companion of Captain Eulate, with whom he dearly loved to spend his time. The two were of the same tastes, yet of opposite temperaments and dispositions, which Sir Walter Scott says is the binding tie between people. Cervera loved Eulate as much as President Cleveland loved Mr. Carlisle, only on a war footing. Eulate was a man who was dispirited and melancholy and tender and steady all at once. His was a mixture in which Cervera delighted. As above noted, he was the only officer besides Cervera who was not required to sign the parole. He rebelled and won over Admiral McNair. He looked like a man of forty, with small, black burnsides. His eyes were brown and passionate and his lips abnormally proud.

Eulate would say, "I have lost all but my commission and my honor." Nobody seemed to know how to take Eulate. He came to Annapolis with a wound in the spine and with a serious scalp wound in the back of his head. He was a picture in blue, and was greatly depressed at the loss of his *Viscaya.* He would frequently remark in a pathetic way, "Oh! my beautiful ship." Later, after the surrender of San Juan, when it was decided that he would not be required to give his written parole, he was seen every day on the streets of Annapolis with the other prisoners. He afterwards stated that his depressed condition was due to the fact that his family was in San Juan, Porto Rico, and he knew sooner or later it would be bombarded, and with the occupation of General Miles, he realized by experience what the fire of the American guns meant and that he would never see his dear ones again. He was a changed man when he realized that no serious condition existed at San Juan, and that his family was safe. He was a fascinating mixture—the most inexplicable and willful and picturesque Spaniard

among them, Cervera not excepted; an affectionate and devilish fellow, this Eulate. He never met a child in the Academy but that he took it up and kissed it on the forehead. One day he took a baby from its carriage in a most careful fashion and kissed it while the nurse was panic stricken. Eulate was thinking of his babies in Porto Rico. His war bumps and his wife and baby bumps were about the same size, and it was the clash of the two that made him such a study.

When Captain Eulate surrendered to Captain Robley D. Evans of the *Iowa*, he handed his sword to Evans in surrender, which the magnanimous officer declined to accept, allowing Eulate to retain his treasured possession because of his brilliant conduct. When Admiral Cervera was received on board the *Iowa* some hours later with other prisoners, he was greatly surprised to see Eulate still proudly wearing his sword —a prisoner of war. It is said that all the other Spanish officers tossed their swords into the sea, which they later deeply regretted when they realized that the Americans would have generously permitted them to retain their cherished insignia of authority.

When Cervera and Eulate had finished their visits to Annapolis, they would start back for the Academy. Everybody along the streets looked at them, but not inquisitively; the curiosity of Annapolis was a well-bred curiosity.

The delicate conduct of the prisoners towards their captors was noticed at the lowering and the raising of the flag in the Naval Academy grounds, when every Spanish officer, no matter where he might be, faced the flag and saluted it. A few afternoons after their arrival, when the sunset bugle was sounding, Admiral Cervera and his son, Lieutenant Cervera, sitting on their piazza, immediately arose, faced the flag, stood at attention, and saluted it.

All of the Spanish officers, during their enforced stay in Annapolis, covering a period of two months, conducted themselves in a most gentlemanly and military manner —at no time did they display the slightest displeasure or violate a single regulation. Under such trying circumstances they behaved like men endeavoring to live up to the high traditions of their naval training. Many of these officers were of the nobility of Spain. It is interesting to consider whether officers of other nations would have conducted themselves with such good spirit and genuine sportsmanship under similar conditions.

In early August, while the Spaniards were in Annapolis, Admiral W. S. Schley, who was temporarily in command of the squadron that destroyed the Spanish ships, arrived at Annapolis to visit his home. On this occasion Schley was tendered a reception by the Annapolitan Club and made a stirring speech to the citizens of Annapolis from a window of the clubhouse. He discussed most interestingly the details of the battle and ended his speech with the memorable words that attracted so much attention at the time: "One hour and fifty-five minutes after the last gun had been fired, the commander in chief arrived on the scene." The daily press the next day touched conspicuously on this detail of the admiral's remarks. The Spanish officers expressed great interest in reading Schley's discussion of the fight and were eager to obtain copies of the morning papers.

The writer of this article, a young chap at that time, met personally nearly all the Spanish officers and talked frequently with Admiral Cervera, Captain Eulate, and the others, finding them at all times ready to discuss in some detail matters of the battle. On one occasion I was strolling up Maryland Avenue with Assistant Engineer Bonet, the chief engineer of the *Colon*. I said, "Bonet, how would you like to meet the chief engineer of the *Oregon?*" "Most pleased," he remarked pleasantly. We approached Mr. Milligan, the chief engineer of that ship, who was leaning on the gate in front of his home. I said, "Mr. Milligan, I would like to present to you the chief engineer of the *Colon*." They promptly grasped each other's hand in a most cordial manner, and after a few words of pleasant greeting Mr. Milligan remarked, "I am so pleased to meet you because I would like to ask you a question which we all do not understand. Why did the *Oregon* overhaul the *Colon?* The *Oregon* at her best can only make eighteen knots while the *Colon* was a twenty-knot ship." Bonet smiled and answered immediately, "Because we were forced to use an inferior Santiago coal and we were also forced to make the firemen drunk with cognac so that they would stoke, and for these reasons we could not make sufficient steam.

We had confidently expected the *Colon* to get away as prearranged."

Admiral Cervera, in conversation with the writer on the porch of his home, discussed briefly the details of the attempted escape of his squadron from Santiago. Speaking in a somewhat understandable English in combination with a few Spanish words, he said he had received several orders to leave port for Havana, but each time strongly protested to Madrid, stating that it would be suicidal and hopeless. The attempt would only result in the loss of his ships and a tremendous loss of life, in view of the overwhelming odds. On July 2 he received peremptory orders to leave port immediately. He decided to make the attempt the next morning (Sunday), at 9:30 A.M. when he knew the Americans would be at quarters. The guns from his ships had been mounted a few days previously in Moro Castle to defend the harbor entrance, there being nothing but old smooth-bore guns in the fort. He immediately ordered all guns aboard, called the captains of the ships to the flagship and informed them of his proposed plans of escape to Havana. He said that he would lead them out with the *Maria Teresa,* the slowest ship, with the band playing. He directed the captains to inform all officers and men to place letters for home and valuables on board the *Colon,* as she would probably escape, and plans were to be made with this end in view. The *Colon* did not fire a single gun in the battle. He said they were all greatly surprised that the old guns in Moro Castle should have held the American squadron at bay for such a long period, as these guns were useless under the conditions.

Chief Engineer Cuenca of the *Furor* was also very friendly with the writer and discussed freely the details of the loss of his ship. He was much amused when he read in the daily papers that the *Gloucester* had engaged the *Furor* and had destroyed her. He said, "Not the case, a six-inch shell from the *Indiana* exploded in the engine and fireroom compartments, and killed every man except myself." He found when he came on deck, that the *Furor* was rapidly sinking and that he was covered with blood without a scratch on his body. It was the blood from the other unfortunate men blown to pieces. He was one of the few survivors from the *Furor.*

There were many incidents of interest in the daily visits of the officers to Annapolis, where they were so cordially received. A lady of Annapolis had a large fan on which she had procured the autographs of all the Spanish officers, and when she asked Captain Eulate to place his signature on her souvenir fan, he politely did so with the pathetic remark, "A souvenir of misfortune." As a fair example to show how friendly and cordial were the relations of the "prisoners" with the Annapolitans and how much at ease they were in their midst, the following extract from the daily press at the time is quoted:

> Yesterday morning, Admiral Cervera, Captain Eulate, and the following Spanish officers, Captain of the Marines Espinosa, Surgeon Barra, Paymaster Mellado, Chief Engineers Cuenca, Rey, and Bonet, Lieutenant Commander Marina, his aid, Lieutenant Imaz, attended the ten o'clock mass at St. Mary's Church, after which they visited the residence of Mrs. J. R. Magruder on Gloucester Street, and were photographed in a group.

During the latter part of their stay they became more and more at ease and made many acquaintances and friends on the streets of Annapolis. As the time approached for their departure, they had become very much endeared to Annapolis and its people, and they were visibly affected at the thought of returning home, as they said all of them would be court-martialed. One officer showed his apparently friendly interest in America by stating to the writer, "I keenly feel sorry for you Americans. Egypt had her day, Rome had her day, Greece had her day, and Spain has had her day. It is coming to you Americans." He made this remark in a very sympathetic and kindly way, and not in a spirit of bravado.

Many of the officers spoke English comparatively well, and it was most interesting to hear their viewpoints of the battle. They discussed it freely and in a pleasant way, except Admiral Cervera, who was not generally very communicative. He was ordered out of the harbor against his will. He went out to die, as one of the Spaniards picturesquely put it, as they regarded the result of the fight a "heroic defeat." They said the dash of Cervera must go down in history as unparalleled for its dramatic gallantry and daring. Some would not express an opinion as to the claims of Sampson and Schley, but one, when asked to write it out, kindly did so. He was asked who was the hero of the fight on the admiral's side. He

mistook the question, and wrote thus: "I believe that not heroe because the American has very superior fleet. I think best was Commodore Scheley (Schley). I not see the *New York*."

But what impressed the young officers most was the *Iowa* and the *Oregon*—they said that these two did the work. Moreover, Captain Eulate said the *Oregon* did it—that a shell from that battleship swept the length of his ship and left a heap of dead and wounded with the blood flowing from the sides of the vessel as lavishly as if it had shipped a sea. What more demoralized him and his men, he added, was the rapid fire of the guns of our fleet. None of the officers seemed to have a distinct recollection of the *New York*, but did not wish to be quoted. They all spoke in a most pleasant way of Hobson, extolling his heroic deed.

The United States was soon at peace with Spain and the world. On August 31, the President of the United States directed the superintendent of the Naval Academy to release the Spanish officer-prisoners and men in the custody of the Navy Department, and Admiral Cervera was so informed to arrange for the transportation of his officers home in accordance with directions received by him from the Spanish Minister of Marine. He and his staff departed from the Naval Academy on September 5, and the remainder of the officers left on September 8 for Portsmouth, New Hampshire, where they boarded the Anchor Line steamship *City of Rome*, which had been previously engaged to convey them to their own country. The *City of Rome* sailed from Portsmouth on September 12 for Santander, Spain.

Admiral Cervera, before taking his departure from the Naval Academy, addressed a most courteous and appreciative letter to Rear Admiral McNair, the superintendent, showing the kindly feeling of himself, officers, and men for those with whom they had come in contact. The following extract is quoted from his letter showing this gratitude:

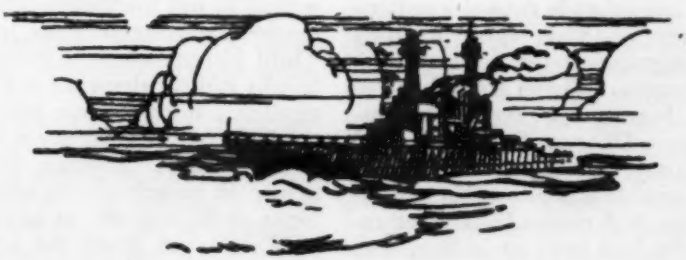
> The courteous and sympathetic welcome given to all of us by the distinguished families living in the Academy is one more title to our gratitude, and Your Excellency may rest assured that it will never be effaced from our memories.
>
> Finally, the perfectly correct conduct of watchmen, soldiers, and all individuals we came in contact with, presenting the notable fact that we depart without having had the least friction, is a thing I take pleasure in recording here.
>
> I intend, if time permit, to go and thank in person the Secretary of the Navy.
>
> It would give me pleasure to return the attentions that I have received.

As the *City of Rome* sailed from Portsmouth harbor, Admiral Cervera's last act was to send the following telegraphic message to Admiral McNair, expressing his personal and kindly feeling of appreciation:

> *Al dejar este país permítame saludarle deseándole toda clase de prosperidad.*
>
> ALMIRANTE CERVERA

Translation:

> On leaving this country, allow me to greet you, wishing you all kinds of prosperity.
>
> ADMIRAL CERVERA



Russia Moves East

By Lieutenant Commander H. M. Kieffer, *U. S. Navy*

THE history of Russia is the history of a pendulum. Striving for expansion to the sea, she has swung from one point of the compass to the other. Balked in the west, she turns east. Foiled in the east, she turns west. As the mass of a sphere gives rise to gravitational attraction, so the huge, inert mass of Russian peasantry seems always to inspire in its government a desire to extend its influence over neighboring states. The shadow of the Bear lay athwart the scenes of Kipling's tales of India; and now, although the Czar is gone, the Bear is still there, peering over the Himalayas.

Russia for the past decade has been a paradox, a conundrum. The answer, as usual, comes from the peasant. He decided in 1917 that he wished to stop fighting, and accepted the only government that would make peace. He now decides that he wishes to keep for himself the produce of his farm, and the government of Stalin is respecting his wishes. But what is the external attitude of the government which he accepts at present? Let us make a brief inspection of the antecedents of several political figures.

When Kerensky, half visionary, half politician, was transformed from a member of the extreme left wing of the Duma into the leader of the extreme right wing of the Revolution, he immediately caused a nation-wide jail delivery, and then signed his own dismissal by telegraphing for the return of all political refugees. There arrived in reply a most significant group, the chief members of which were Ulianov, Braunstein, and Zinoviev. Ulianov, a journalist, had been banished to Siberia on account of his revolutionary activities, had escaped and later returned to Russia, had been again banished, and had again escaped. His brother had been executed by the Russian government on the charge of treason. Ulianov now returned freely under the name of Lenin.

Braunstein had also been banished to Siberia, where his rankling anger had found vent in the composition of pamphlets. He also escaped, and at the time of the fatal telegrams was in New York, happily filling the columns of a communist newspaper, the *Novsky Mir*, with a maze of Marxian doctrine. He had not been in America very long, but his brief stay sufficed to make him somewhat of an expert, in revolutionary circles, on American conditions. He returned to Russia, via a detention camp in Halifax, and appeared under the name of Trotzky.

The reasons behind these changes of name do not appear. Probably the caution of the hunted asserted itself. At any rate, history records, instead of Ulianov and Braunstein, Lenin and Trotzky. The British military attaché in St. Petersburg at the time records current rumor as presenting Lenin as a fanatic with a clever brain. Trotzky was supposed to have been a German revolutionary agent. Trotzky in his later books vehemently denies this charge, and in fact no substantiating proof has appeared.

The pair had certain differences which were smoothed out, and Trotzky accepted the leadership of Lenin. The following establishment of the Soviets and the negotiations for peace need not be discussed. Lenin came into power with a cabinet almost entirely ready made, each member a theorist willing to put his theory into practice. The trusted Zinoviev held the leadership of the Third Internationale, a congress of the most blindly radical elements of the world, whose exultance in opposition has finally deprived the body of the influence it was at first supposed to have. Trotzky, the fighter, or the prince of pamphleteers, whichever way one looks at the matter—at any rate an efficient publicist—was given the army. His influence with the soldiers was probably responsible, but one can see the shrewd policy of Lenin in the manner in which this uncompromising firebrand was thus kept clear of

whatever constructive work lay ahead. Heads of other departments were appointed, under rather baffling titles, and among them was a Georgian named Stalin. He was given charge of the racial policy.

The personality of Stalin eludes the student of the early phases of the history of the Soviets. The *Encyclopedia Britannica* in its 1922 supplement records the history of Trotzky, always in the limelight, and of Lenin. Krassin is recognized, and Bukharin is mentioned under the heading of Lenin, but Stalin is not mentioned. And at present, this man controls Russia insofar as the inert bulk of Russian peasantry can be controlled.

Stalin was a lieutenant of Lenin's before the October revolution. Such is also the claim of most present-day Russian politicians, but in this case the relations were such that Stalin was placed in charge of a very important phase of Soviet activity—the handling of the racial minorities. Himself a member of such a minority—the Georgians of the Caucasus—it may be inferred that his first-hand knowledge of the aspirations and fears of these peoples pointed to the unusual action taken as a first step. Against the advice of Bukharin, a propagandist turned advisor, Lenin issued a call to any and all groups to form, if they so desired, separate republics independent of Russia. The response was immediate. Self-determination was in the air, and a large number of small republics came into being. These republics were then invited to join the Union of Soviet Republics. A striking division then appeared among these small states.

Those states that were predominantly European stayed out of the Union; those that were Asiatic rejoined. Finland, Esthonia, Latvia, and Lithuania now stand with Poland and Czechoslovakia as buffer states along the western frontier.

Azerbaijan, Armenia, and others came back into the fold, sovietized. Hopes were high in communist circles that they were the forefront of a stampede of Asiatic countries into the Soviet circle. An immense effort in the matter of propaganda was put forth in Turkey, Persia, and Afghanistan, and a change of government occurred in all three. The result at present, however, is that Turkey has emerged practically under the dictatorship of Kemal Pasha; in Persia Riza Kahn ascended the throne in 1924; and Afghanistan has been convulsed by an overstrenuous effort to convert the country overnight to an external similarity to Europe. Far from being sovietized, these states are appearing as buffer states along the southern frontier. The New York *Times* recently quoted the "usually well-informed" *Germania*, the organ of the German Centrist Party, as predicting an Afro-Asiatic alliance of Persia, Afghanistan, Turkey, and Egypt, and mentioned these countries as withdrawing from Soviet influence. "From communist influence" would perhaps be a better phrase. Their relations with the Russian government appear very friendly; and the latter, comforting itself with the Marxian axiom, repeated by Lenin, that the proletarian revolution cannot take place in an agricultural country, is extending the hand of anti-imperialist, instead of anti-capitalist, friendship.

Stalin is the exponent of this change. When he speaks of Russia's enemies, he speaks of the "imperialistic" nations. Capitalism, the abstraction, is disappearing as the objective of Russian effort—mainly on account of the peasant. Lenin finally came to realize the impossibility of treating the farmer as a member of the proletariat of the mathematical theorists, and the New Economic Policy was the result. It was defended in debate as an "economic retreat" and so on, but it stood. Lenin died, and his lieutenants fell to disputing among themselves. Roughly, Zinoviev and Kamenev advocated the complete subjugation of the farmer and the establishment of a complete dictatorship by the industrial worker. They lost their case. Zinoviev today, after losing office after office, has finally lost his grip on the Third Internationale, the Komintern. He opposed the farmer.

Trotzky led a second group, which recognized to a degree the necessity for conciliating the farmer. He advocated the establishment of class distinctions among the peasants, and the use of the poor peasant, in conjunction with the industrial worker, to support a communistic government in the face of the opposition of the Kulak, the peasant grown wealthy. Trotzky was also expelled from the government, and is now again writing pamphlets in a place of exile. He opposed the farmer.

Stalin recognizes the twenty-two million small farms of Russia as the basis of future Russian prosperity. Although not in office,

he holds the leadership of the party, and the Communist Party, in accepting his leadership, has taken a step towards becoming a representative Russian party. In several recent books—*Incredible Siberia,* by Junius Wood, and *Present-Day Russia,* by Ivy Lee, among them—the authors call attention to the fact that the old guard of European revolutionists has almost passed out of the picture, and that a new generation of office-holders has come into power. These have never been thrown into close contact with industrialism, and ideas other than that of the industrial revolution are coming to the fore.

In a book published in China, Mr. Kasuji Fuse, correspondent of the Tokio *Nichi-Nichi* and the Osaka *Mainichi,* has given an extremely interesting set of impressions gathered in Russia during the past several years. He speaks of an interview with Stalin in 1925, and quotes him as saying, "I am also an Asian." Mr. Fuse continues: "I did not only realize that Stalin was a Georgian and pure blooded Asian, whose hair and eyes were black and whose complexion was yellow, looking exactly like a Japanese, but Soviet Russia herself, whose power of control is grasped by Stalin, was also an Asian country." And he shows that of the six major groups of republics which compose the Soviet Union—Russia, Ukraine, White Russia, the Caucasus, Usbeg, and Turkoman—the latter three had at the head of their governments Soviet chairmen who are Asians. The population of the three republics is relatively small, but still they stand as an indication that Russia's present movement to the east is by means of growth rather than by conquest.

It is perhaps natural that Russian foreign policy should have an internal as well as an external effect. The extended contact with China undoubtedly fostered the Nationalist movement under the Kuomintang. This movement has more and more ceased to be communistic, and the trend toward Nationalism in China has been paralleled by a similar trend in Russia. Trotzky brands Chiang Kai-chek as a traitor to Internationalism. Prior to the recent Russo-Chinese rupture, Stalin hailed him as a brother, and lauded the success of his party in the face of the "imperialist" nations of Europe and America. During a period when Russia was almost entirely cut off from Europe, the governments of Russia and China were in very close touch. Recently Stalin stated that Russia had been opposed to Chang Tso-lin for the reason that Chang had based his entire policy on the differences between Russia and Japan, and emphasized the desire of the present Russian government for the most friendly relations. This attitude toward the one nation of Asia that can be regarded as essentially industrial and capitalist must make Trotzky and Zinoviev turn in their political graves.

In viewing the extent of territory which has been brought under Soviet influence, there comes to mind the previous sway of the Mongols over the same territory. As a historic coincidence, though hardly a parallel, we may remark that the territory of the buffer states along Russia's European frontier represents the high-water mark of the Mongol advance westward. Here it was that Chepe Noyon, the wandering lieutenant of Genghiz Khan, defeated one German and one Hungarian army, avoided a strong Bavarian Army, and turned back to the east. In the south, where once the Mongols cut through the kingdoms of the Abbasids and the Assassins until halted by the Mamelukes, the Mohammedan countries have banded together into a bulwark against communism, incidentally protecting India. In the east, where in hundreds of forgotten battles and sieges the Chinese desperately resisted the Mongol advance, China now, although welcoming Russian assistance, still turns a deaf ear to the doctrines of Marx.

When the tide of sovietism reached Mongolia, the failures of propaganda in Turkey and in Persia had left little hope in Moscow that communism would succeed in a country so lacking in the elements of an industrial civilization. Mongolia is populated largely by nomadic herdsmen. The country is backward even in agriculture. But overnight, almost, Mongolia became communized. There occurred first a "Nationalist" revolution in 1921. The Hutukhutu, or Living God, was left in nominal control, with a mildly radical premier and cabinet. These latter, proving too mild, were shot to death in 1922, and the regular Soviet organization came openly into power. The Hutukhutu was not shot, probably because he was expected to die soon anyway; but after his death in 1924 no successor followed him. The Buriat and Mongol Republic is now one of the ten small

republics forming the Russian Soviet Republic, which is in turn one of the six major republics of the U.S.S.R. The entire absence of an industrial proletariat in this promising protegé puzzled Moscow, and steps were taken to remedy the defect. Factories were transferred bodily from Russia to Mongolia. Quoting Amor, chief of the delegation from the Mongolian government to Moscow: "Prior to the revolution, there was not a single factory in Mongolia. Today we have leather, soap, chemical, and other factories, and are developing gold mining and many other industries."

Mongolia took up communism while the Russian peasants opposed it. Mr. Fuse examines this situation and comes to the conclusion that, owning as they do very little besides their *yoorts* or tepees and a few cattle, the Mongolians have little to lose under the new régime. Having no wealth, they can lose none. There would, however, appear to be a more general principle underlying this particular situation. The Mongolian herdsmen represent a type that has been in existence since the dawn of history—the nomads. Another type—the farmer—has within the extent of our knowledge always been a contemporary of the nomad. The nomad desires absolute freedom to travel at will; he resents ownership of the land by anyone who halts his use of what he regards as common pasturage. He takes from the land but puts nothing into the land. He reaps without sowing. The farmer sets aside a bit of land and works over it. His excess produce he stores against a time of need. His stores demand shelter and defense. His life becomes stabilized, and this stability in time produces cities and industry. He is a landowner and a capitalist, while the nomad is naturally a communist.

These two types have been in perpetual conflict, always. The marches of Genghiz Khan, until his sons settled down as rulers of the captured lands, represented nomad victories over the agricultural peoples of Islam and China. The most imposing conflict between the two types in fairly recent years has been the steady march of the American squatter-farmer west, and his thorough defeat of the Indian nomad; and the last echo of this march appeared in the form of the border wars of thirty years or so ago between the sheep-herders and the cattlemen of our plains in attack on and defense of the theory of the open range. In the still more recent past, we may note the spread of radical theories among the "wobblies," or migratory laborers, nomads.

So Mongolia became sovietized, although possessing no industrial proletariat. The government of the country in 1922 and 1923 was a mélange that should have satisfied everyone. The divine right of sovereigns was represented by the presence of the Living God as head of the state. The other extreme was represented by the Youth's Communist League, hard at work proselyting. Representatives of the labor unions were urging the descendants of Genghiz Khan to come into the new factories, start making soap, and organize.

Russia's approach to the east is by means of the trans-Siberian Railway. At the farther end of this railway a recent phenomenon has occurred. The Shantung famine in Nationalist China started a starving population on its way to the north. Families gathered together what belongings they could carry and began a few months' walk into Manchuria, the promised land. Japanese colonists have been submerged by the flood of newcomers, and Manchuria is in a fair way to become Chinese rather than Manchu. Will Manchuria be for the present Russian government the point of focus that it was at the beginning of the century? A recent observer, Mr. Wood, places his finger on the Sungari River as the scene of some very interesting future happenings.

In the meantime, the Soviets have been attempting to force the plan of life of the nomad on his arch enemy, the farmer. Trial and error are indicating that in the degree that the farmer becomes literate and prosperous, a communist government will find its position untenable. As an edifice of industrialism has never been reared on a nomad base, so, paradoxically, the Russian government must abandon communism in order to produce the industrial conditions which it asserts are necessary for the establishment of communism. The moral is, that in the last analysis the farmer will rule the "Granary of the World"; and that the major effect of the establishment of the Soviets has been to cause the Russian government to recoil from the deadline drawn across Europe and to seek in the east the exercise in foreign relations which preceding governments have periodically sought.

Small-Boat Sailing *as a* Character-Builder *in the* United States Navy

By COMMANDER JOHN WARNER MOORE (*Ch.C.*), *U. S. Navy* and
LIEUTENANT COMMANDER ALFRED P. H. TAWRESEY, *U. S. Navy*

THE UNITED STATES NAVY no longer depends upon sails for primary motive power. Nevertheless, it would take a bold man to say that sails are of no further value to the service. If it became necessary to abandon ship far out at sea, for many a man of the Navy sails might easily mean the difference between life and death. Proceeding from San Diego to Balboa, Canal Zone, for the 1929 Fleet Concentration, the mine sweeper *Partridge* bent on some auxiliary sail power in the interest of fuel economy. During the 1924 maneuvers of the U.S. Fleet, the commander of the Scouting Fleet granted permission to certain of his commissioned officers to proceed to Panama at personal discretion to try theoretically to disable one of the Battle Fleet's battleships in a Panama Canal lock. Taking a small boat under sail, they reached Panama undiscovered, and while the U.S.S. *New York* was in a lock at Gatun, had the satisfaction of informing the *New York's* commander that then and there the ship's magazines had been exploded. This case was "laughed out of court" later but, for all that, it proved great potential striking power on the part of a determined and crafty enemy in whose scheme of action small-boat sailing was a vital factor.

SAILS AND MORALE

The indispensable service sails render the United States Navy today, however, seems to the writers to be their use when bent on dinghy, whaleboat, and motor launch for purposes of recreation and for fleet regattas. Sails then, in the name of sport, render the Navy a service which the writers believe is second to none in upbuilding morale, the will to win, and qualifications in characteristics essential to victory at sea.

Conrad once remarked: "It seems ships came into existence for the very purpose of 'keeping human beings up to the mark.'" At peace or at war, man has never had anything put into his hands the equal of a ship! Certainly it is true that neither at anchor nor under way is there anything known to man that elicits such vigilance in maintenance as does a ship.

What the cruiser under steam is to a commanding officer, dinghy, whaleboat, or motor launch under sail can be and is to many of junior rank and of enlisted rate in the Navy. Small boats under oars or motor power are usually merely symbols of labor to Navy personnel, but any hairy chested fellow with a bit of Jones's soul in him, finding himself in one of our boats under sail, matched against alert and eager opponents, immediately reacts to the thrill of harnessing wind and wave to his will, and to matching his wits against worthy opponents at the helm. His eye brightens. He sniffs the battle from afar. In the twinkling of an eye the very qualities of heart and hand and seamanship, essential to victory at sea, dominate his whole being.

A GLIMPSE AT THOSE "FINDING THEMSELVES" IN THE NAVY

To train the personnel in the school of the ship, in their military duties, in keeping the ship smart, to build up any original enthusiasm for the service, and at the same time to avoid the deadening effects of drill and routine procedure, is a first care of any command.

The present personnel of the Navy is ready to hand for all such purposes. It is true that some persons have come into the Navy with the sole intention of bettering themselves at a minimum return to the coun-

try for value received. By far the majority of the Navy personnel, however, have come into the service for the romance of it. "Experience in far countries!" "Business in great waters!" "The first to fight!" "The Flag," were the lures that caught them. Nor were the lures false.

Yet the first thing many a recruit finds in his hand is just such a broom as he saw too much of at home. Or his most intimate acquaintance for many a day proves to be a swab or an oil can. Meanwhile the junior officer finds his time filled with inspection of lockers, hair cuts, and logging his notebooks for the pitiless eye of some lieutenant commander—all eased by considerable "fourth-class liberty," or the watch below at the one and only time a man can expect to circle the Bay of Cattaro.

Known to the Navy are many correctives and stimulants of proven worth, for the treatment of personnel in the service, suffering from lack of morale. But of all known correctives and stimulants to be used in regaining or in upbuilding "morale," the writers know of none quite the equal of a Navy small boat under sail.

Wardroom Interest in a Sailing Regatta in the Navy

Sailing regattas in the Navy naturally do not stir civilian interest to any extent, nor are they taken by the Navy itself with any greater seriousness than attaches to many another form of service athletics. On the other hand, as the date of a sailing regatta approaches, wardroom interest in the sailing ability of the various officers concerned becomes very real. Behind much friendly banter, eyes are fixed on the "wins" and "trimmings" of contestants in practice. To the officers in charge of sailing craft monotony is a thing of the past, and every day has its surprises and thrills, even in practice.

The Enlisted Man's Reaction to Sailing

For the enlisted man who has won a place in a racing boat under sail, seamanship and the Navy itself become something new and worth while.

Time and again, as the writers have trained crews for a sailing race, they have observed the metamorphosis of landlubber, of blasé petty officer, into a seafarer such as John Paul Jones himself would have welcomed to his side. With the scent of a sailing race in the wind the most insignificant seaman second class sheds many of his lubberly ways almost over night. In his bare feet he moves about the boat like a panther. Every line, every halliard, every pin in the boat takes on a new meaning for him, becomes an object of his unremitting scrutiny and care. He envies the salty sailor who can splice a parted line in the midst of flying spray and whipping canvas. He resolves that he, too, will qualify in such respects. He learns to anticipate commands, so that when the boat is put about, or performs some other evolution, his part in the maneuver is so well timed that the boat seems to get the word herself, and of herself do what is required. He becomes clever at "lending a hand." He shows hostility toward anyone that seems to be slow in executing a command. He learns to win or lose like a sportsman. Returned to the ship after a race, he will gladly turn to on his boat to correct any faults in her, to remove the scars of battle from her. He looks with a jealous eye upon rival boats even in his own ship. No rival shall be allowed to approach his boat in smartness.

Returned to the ship with a race won, and a scalp dangling at his waist, with a bit of a "roll" he strolls about the decks. His shipmates view him with a tinge of envy and respect. Unconsciously he becomes resolved, insofar as he is able, to put his ship up a peg in other excellence beside that of winning a few sailing races. The ship's record in gunnery and in engineering becomes interesting to him. He takes a renewed interest in his personal appearance. Finally, he is absolutely committed to letting the folks at home know what a great institution the Navy is and what a fine ship he is on. Incidentally, the folks at home will see a change in their boy that will make them proud of him, and enthusiastic about the Navy.

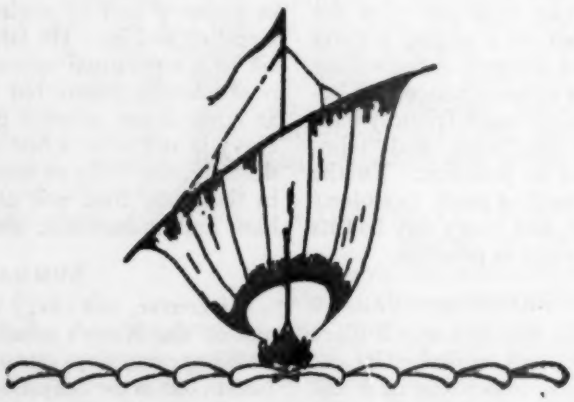
Summary

Of course, not every man who steps into one of the Navy's small boats pointing for a sailing race, steps out of the boat a budding Jones; but in the majority of cases those taking part in handling our small boats under sail, for fleet regattas, or even for personal sport, do step out of their boats with every element of seamanship and morale cited above alive in them and on the increase. The shadows of Jones, of Porter, and of Farragut have unmistakably fallen upon them. It

becomes apparent that where otherwise for many a month to come the ship and the service might have had "only one more hand in the division," now, ship and service have gained a first-class fighting man, whose eyes are open to the power and the glory and the romance that is the United States Navy, and who yearns to be of it!

As we think of these things, whatever may be claimed for other methods of training men in the realm of commerce and of war, sail navigation remains the method par excellence for the development of character. Power navigation is essentially mechanical, navigation by oars is essentially physical. Sail navigation blends the mental, physical, mechanical, and moral factors into one well-balanced stimulation to the formation of character. It contains ever new surprises promoting the development of resourcefulness. In promoting fortitude and determination, it pits man against the ruthlessness of nature, ever the most absorbing contest of all. It requires the nicest kind of teamwork, promoting the ability to coöperate, to do for and with one's fellows. It presents fickle and sudden changes in conditions, fostering the development of the highest order of judgment. It affords opportunity for competition with the greatest number of unknown conditions to be met, promoting the development of the spirit of sportsmanship. It requires the closest attention to detail, promoting habits of care and thoroughness and efficient upkeep. Finally, it pays the highest dividends on the skill of those engaged in it, for in sail navigation the prize goes not necessarily to the one who is strongest, or who benefits most by the skill of the designer and resources of the builder, but to him who is most watchful, resourceful, bold, courageous; in short, to the one who has developed a superior character.

Whatever builds character is of inestimable value to mankind. There is no walk of life, no human activity, no human relationship, however minor, which is not benefitted by the development of individual character. In an activity so complex as the Navy, and so vital to the welfare of the nation and hence to Ayrian civilization, the development of character is of prime importance. Man has not yet developed an activity so sure, so speedy, and so thorough in the development of character as sail navigation.



Something New *in* Rudders

By LIEUTENANT (J. G.) WALTER S. GINN, *U. S. Navy*

PRIOR to the *Patoka's* annual overhaul last year, we received word from the Bureau of Construction and Repair that an Oertz streamline rudder would be fitted while the ship was in dry dock.

The idea of the full-nosed leading edge of the modern plane wing to the uninitiate is perplexing. In explaining it to himself, he is apt to conclude that the reason for having such a blunt nose with extreme thickness one-third the way toward the tapered after edge is for strength. When shown the results of wind-tunnel experiments with thick shapes, however, he learns that it is not simply for strength, but particularly for its low resistance to air flow and its tendency to create a maximum lifting force or lift. In much the same manner, the Oertz streamline rudder fitted to the *Patoka* possesses in its airfoil shape low resistance to flow and maximum steering effect, akin to lift, and so adds another chapter to prove the analogy resting between aërodynamics and naval architecture. The honors for this development belong to Dr. Max Oertz.

Before the World War, Dr. Max Oertz was best known as the designer of sailing yachts, famous among which were the *Meteor* and the *Germania;* so it was quite natural for his genius to be recognized during the war by his selection by the German Imperial Government to experiment with hulls for seaplanes and to further his study of the principles underlying streamlining to use in aircraft construction. His work was so thorough that it led to his designs being used in the building of giant planes. From aërodynamics, he turned back to ship design, which was followed by the application of the airfoil shape to a rudder.

Dr. Oertz is said to have based his rudder on the study of Dr. Junker's experiments with thick shapes in the Grettinger wind tunnel. Finding the airfoil as shown in Fig. 1 to give the lowest resistance to flow with a maximum lift when set at the angle shown, he decided to adopt that shape for his rudder. Now, streamlining is an old story to the naval architect, who has

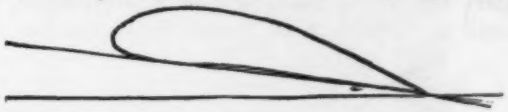


FIG. 1. The airfoil with smallest resistance to air stream and the greatest lifting force.

used it for years in designing fixed underwater appendages, such as shaft struts; but all the emphasis was placed on the reduction of resistance to flow—drift. In aërodynamics, the emphasis was laid on lift, and it was in the incorporation of both of these features in a rudder that lay Dr. Oertz's real contribution to naval construction.

In practice, Dr. Oertz found the use of the exact airfoil not feasible in designing his rudder; so he devised a modified form, which not only gave symmetry about the longitudinal axis, but at increasing rudder angles approached more and more the air-

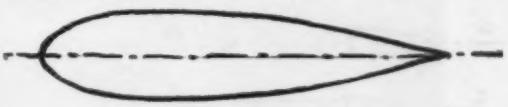


FIG. 2. The modified airfoil..

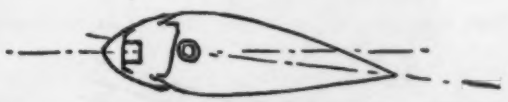


FIG. 3. The rudder approaches the airfoil in form at increasing rudder angles.

foil. Figs. 2 and 3 illustrate this feature. In attempting to put one's finger on its secret of success, this singularity of being able to approximate the airfoil at increasing rudder angles is the keynote.

The *Patoka's* rudder is constructed in two parts and carries out the modified airfoil. The forward part is stationary and is actually the rudder post. Its forward edge

is similar to the blunt-nosed leading edge of an airplane wing. At its midpoint it is given a conical embossment in line with a specially fitted propeller hub cap in order to carry out the streamline of the hub. From photographs of the stern, it would appear that the propeller shaft was recessed into the rudder post. This stationary forward part is fitted with gudgeons for carrying the movable after part, the rudder proper, and it is fitted with overlapping side plates, which form a recess into which the after part fits. The movable part is of hollow, built-up construction, water-tight, and carries out the streamline of the ship. In turning, the forward edge of the movable part slides into the recess of the forward part, but it is so constructed that on the opposite side there is practically no break in the faired surface between the forward and after parts. Fig. 4 gives a side view of the rudder. Its manufacture and installation were accomplished by the yard force of the Philadelphia Navy Yard from plans furnished by the patentee during the three weeks the ship was dry-docked.

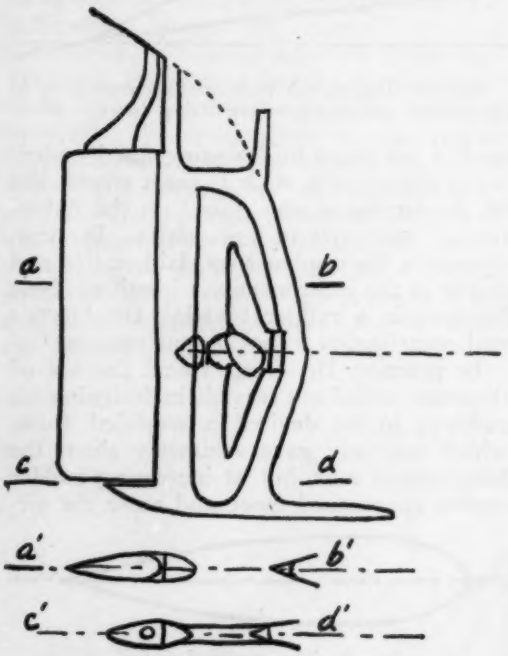


FIG. 4.
Side view of *Patoka* rudder, with cross sections.

The operational effects of the rudder are explained as follows: when the ship is under way the blunt-nosed leading edge, being stationary, controls and steadies the flow of the propeller stream. This action is present at all rudder angles and is given as the reason for its use. The streamline then takes charge and carries the flow past the rudder. At no time does the water swishing along the streamlined plates get out of control to swirl in eddies, as happens with the old-type rudders. Fig. 5 illustrates the comparison of flow between the streamline rudder and the ordinary rudder. The braking and eddying effects of the ordinary rudder were the causes of high resistance to flow and resulted in poor steering qualities.

On this ship the steadying effect of the fixed rudder post has been to diminish yawing. In addition, the airfoil qualities of the rudder are evident from the increased rudder effect at small angles of helm. From this it would be natural to conclude that the Oertz rudder does function similarly to the airfoil in the wind tunnel. The economies made possible by the use of this rudder on a single-screw ship are many: better steering qualities, more efficient propeller action, less resistance, and increased speed.

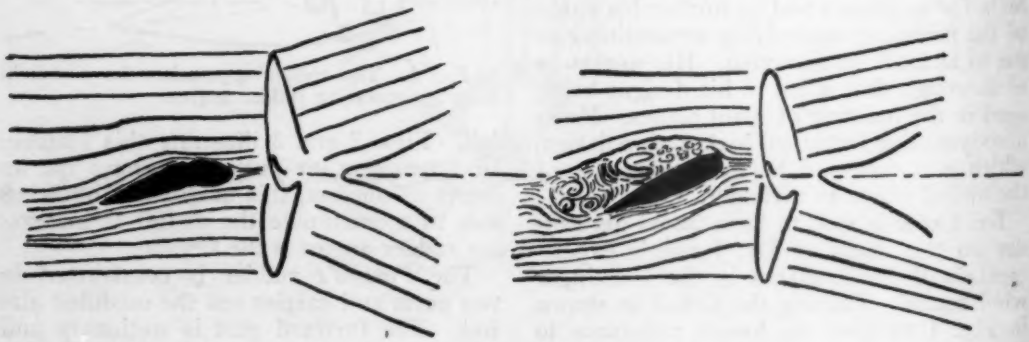
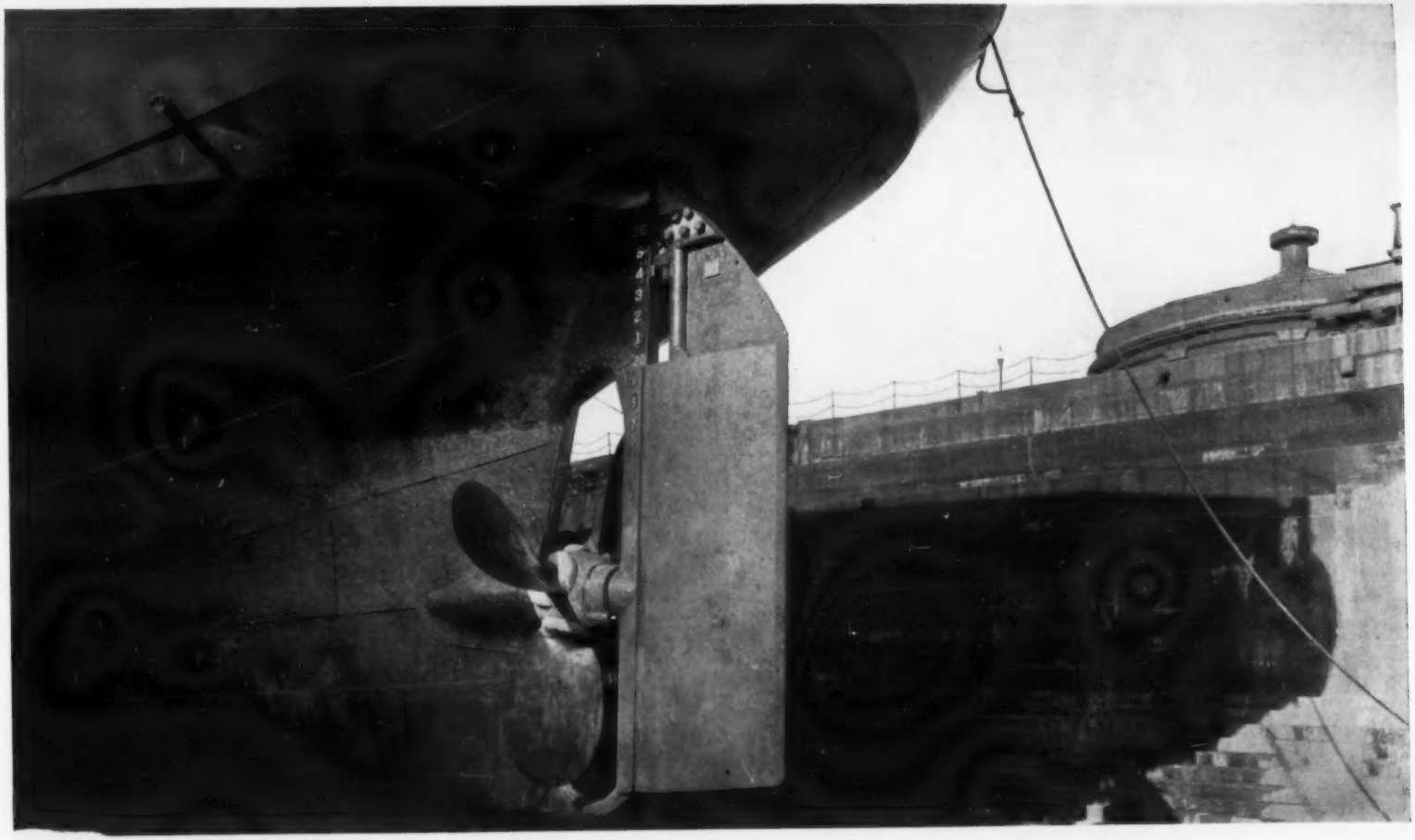


FIG. 5.
Comparison of water stream flowing past streamline rudder with that past ordinary rudder.



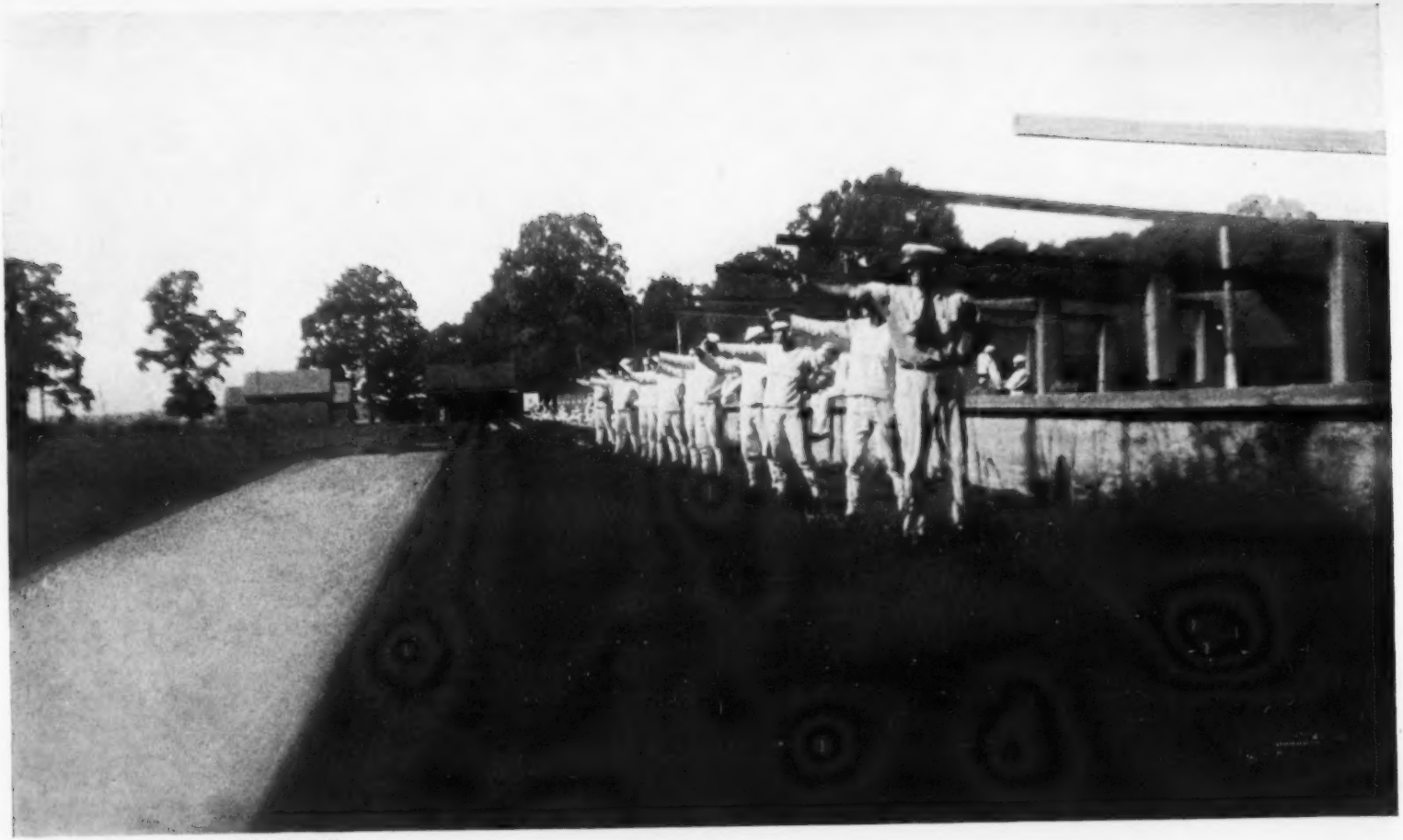
Courtesy Lieutenant W. S. Ginn, U. S. Navy

RUDDER INSTALLED ON U.S.S. *PATOKA*

UNIV. OF WICH.

Courtesy Midshipman C. H. Parks, U. S. Navy

SMALL BOATS AT THE NAVAL ACADEMY
Afternoon drill with oars and sail.

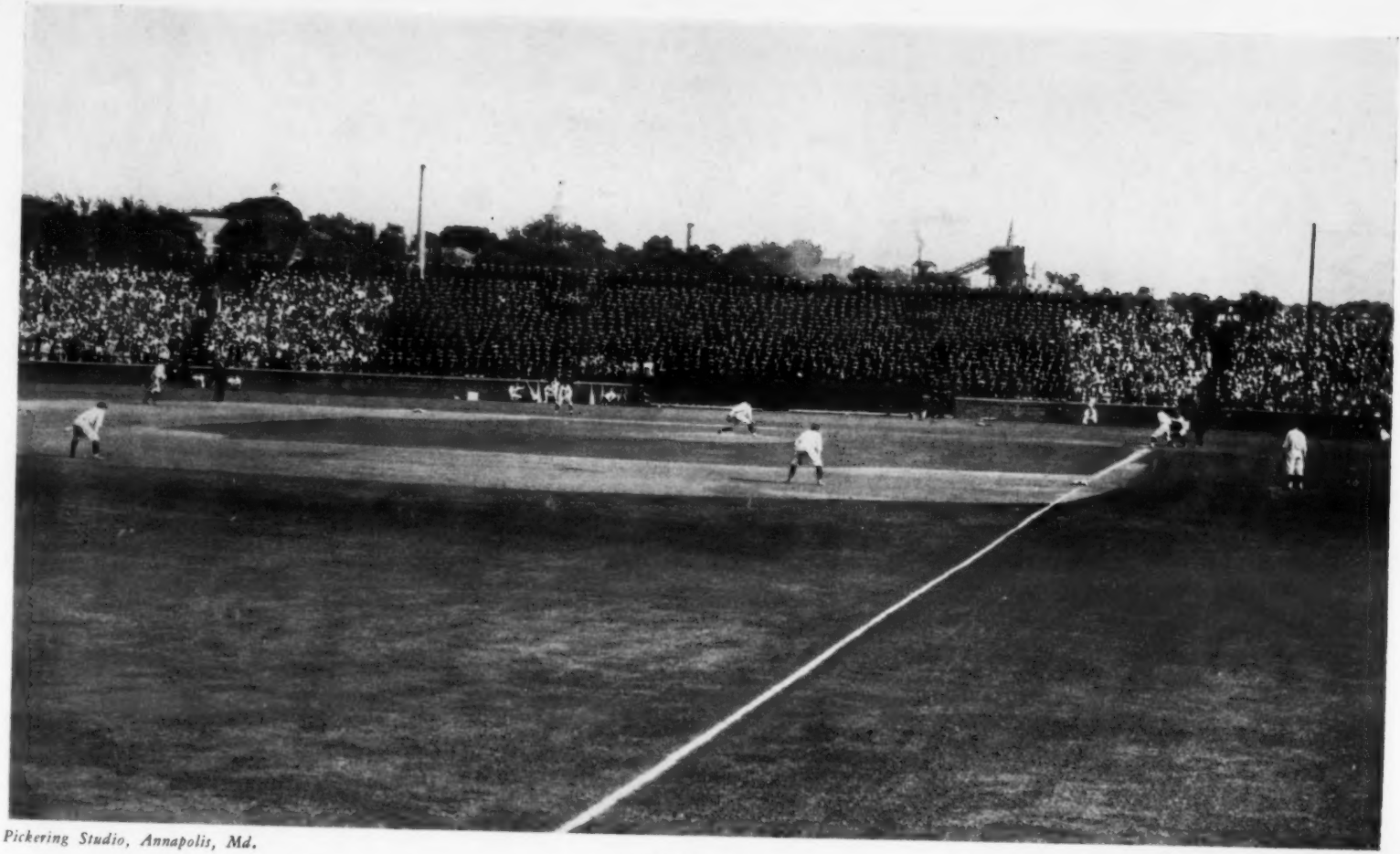


Courtesy Midshipman C. H. Parks, U. S. Navy

PISTOL PRACTICE

Midshipmen receive intensive training with small arms.

UNIV. OF MICH.



Pickering Studio, Annapolis, Md.

BASEBALL

Game between West Point and Annapolis, played at the Naval Academy in 1928 and won by West Point.

Pickering Studio, Annapolis, Md.

TRACK

Finish of a spirited race between West Point and Annapolis held at the Naval Academy in 1928.

UNIV. OF MICH.

By Ewing Galloway, N.Y.

THE CREW

One of the midshipmen's eight-oared shells in practice on the Severn.

By Ewing Galloway, N.Y.

TENNIS

The tennis courts at the Naval Academy, with the buildings of the academic group in the background.

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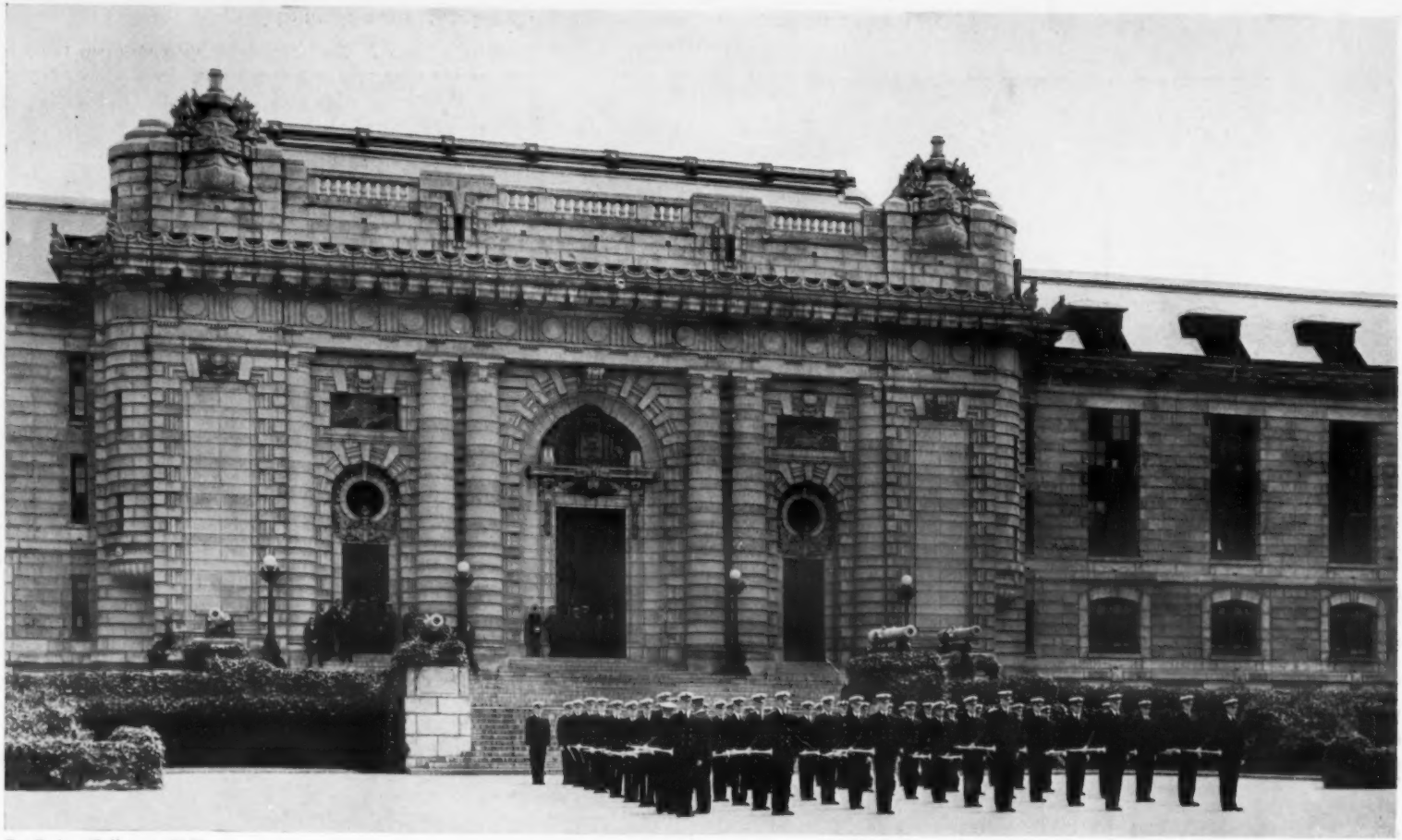


By Ewing Galloway, N.Y.

THE MIDSHIPMEN'S DRUM AND BUGLE CORPS
The main entrance to Bancroft Hall, U. S. Naval Academy, in the background.

A Study *of the* Possibilities *of the* Diesel-Engined 10,000-Ton Cruiser

By CAPTAIN A. M. PROCTER, *U. S. Navy (Retired)*

THE problem of the Diesel-engined capital ship was considered in an article published in the July, 1929, number of the Naval Institute PROCEEDINGS. When this article was written the Diesel-engined cruiser seemed a remote possibility. Since that time much has happened, and it is the purpose of this study to make a survey of the subject, based on the situation existing at this time, January, 1930.

CHARACTERISTICS OF EXISTING CRUISERS

An important phase of the subject is the effect on type of fitting Diesel engines. This involves a general survey of the problem of cruiser design.

The conditions imposed by the Washington treaty provided a working capital of 10,000 tons without water and fuel. In the solutions arrived at by the treaty-power designers there is a general similarity of type. The battery, limited to guns of eight inches caliber, varies between eight and ten guns for the main battery. There is, however, a wide variation in the maximum power, which results in a wide variation in the weight available for protection.

The characteristics of late cruisers of the several treaty powers, as given by Brassey, are as follows:

In the table below the German solution permitted under the terms of the treaty of Versailles has been added. In spite of the heavy battery of 11-inch guns, this ship must be considered as falling in the cruiser class, coming at the top of the protection and armament scale, and at the bottom of the speed scale. The speeds given, in the last column below, have been adjusted to the speed curve on Fig. 5. If the power of the *Ersatz Preussen* has been correctly stated it is evident that the speed will be nearer twenty-eight knots than the stated speed of twenty-six knots.

It is by no means certain that the heavy guns permitted to the Germans give a superiority in gun power.

THE PROBLEM OF THE BATTERY

The greater striking power of the heavier projectile must be balanced against the greater volume of fire with 8-inch guns.

If the same weight be allotted to the 8-inch battery, a materially greater weight of projectiles can be delivered in a given time with an 8-inch battery, than with an 11-inch battery. This follows from the law of similitude, first stated by Normand in 1896 with respect to reciprocating engines.

Ship	S. H. P.	Ratio	Battery	Ratio of caliber	Adjusted speed knots
Trento	150,000	3.00	8 8-in. 12 4-in.	1.10	35.0
Ashigara	130,000	2.60	10 8-in. 4 4.7-in.	1.29	34.0
Tourville	120,000	2.40	8 8-in. 8 3-in.	1.00	33.5
Pensacola	107,500	2.15	10 8-in. 4 5-in.	1.30	33.0
Cumberland	80,000	1.60	8 8-in. 4 4-in.	1.01	31.0
Ersatz Preussen	50,000	1.00	6 11-in. 8 5.9-in.	2.23	28.0

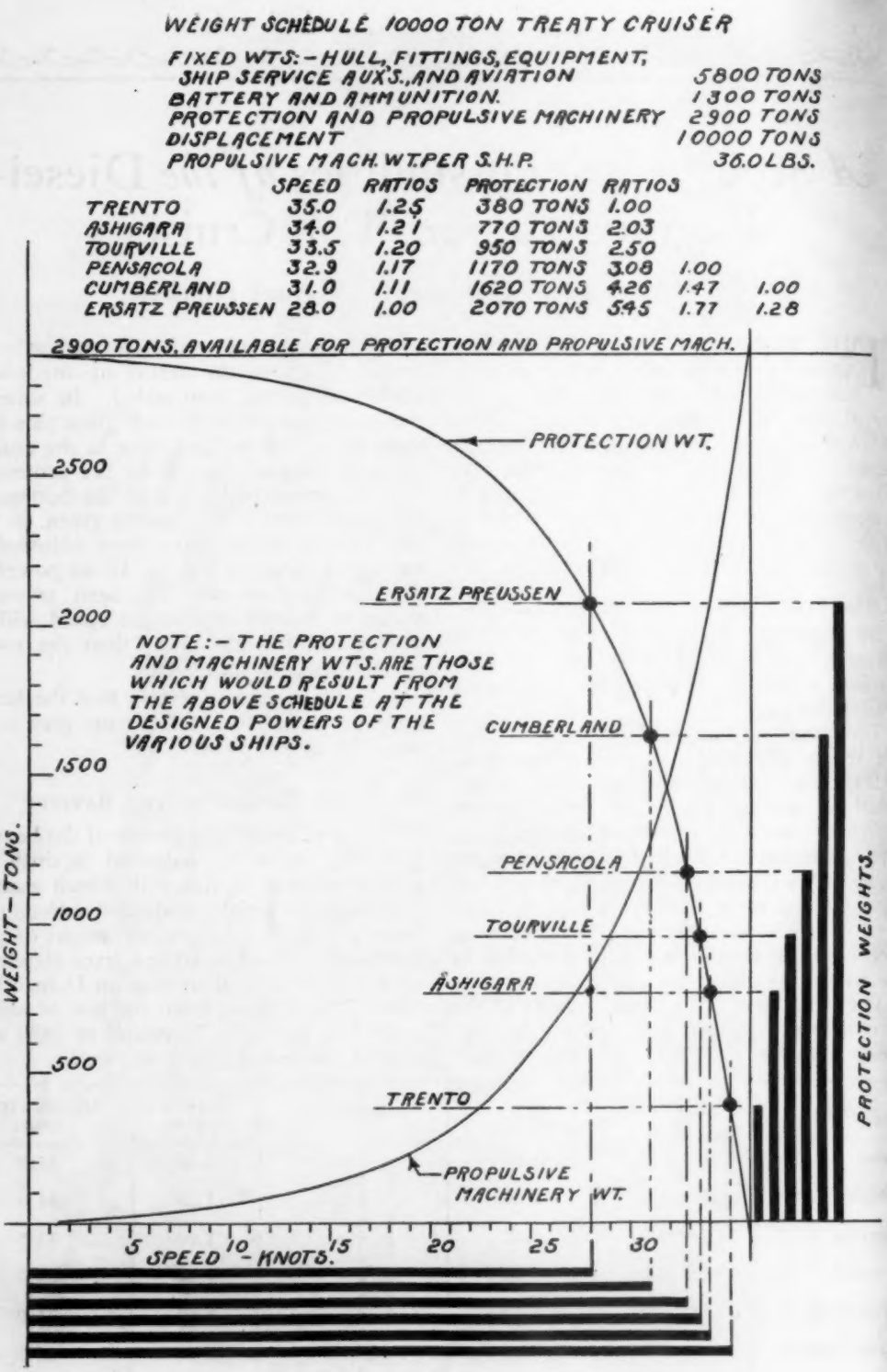

WEIGHT SCHEDULE 10000 TON TREATY CRUISER
FIXED WTS:-HULL, FITTINGS, EQUIPMENT, SHIP SERVICE AUX'S., AND AVIATION 5800 TONS
BATTERY AND AMMUNITION. 1300 TONS
PROTECTION AND PROPULSIVE MACHINERY 2900 TONS
DISPLACEMENT 10000 TONS
PROPULSIVE MACH. WT. PER S.H.P. 36.0 LBS.
SPEED RATIOS PROTECTION RATIOS
TRENTO 35.0 1.25 380 TONS 1.00
ASHIGARA 34.0 1.21 770 TONS 2.03
TOURVILLE 33.5 1.20 950 TONS 2.50
PENSACOLA 32.9 1.17 1170 TONS 3.08 1.00
CUMBERLAND 31.0 1.11 1620 TONS 4.26 1.47 1.00
ERSATZ PREUSSEN 28.0 1.00 2070 TONS 5.45 1.77 1.28
2900 TONS. AVAILABLE FOR PROTECTION AND PROPULSIVE MACH.
PROTECTION WT.
2500
2000
ERSATZ PREUSSEN
NOTE:- THE PROTECTION AND MACHINERY WTS. ARE THOSE WHICH WOULD RESULT FROM THE ABOVE SCHEDULE AT THE DESIGNED POWERS OF THE VARIOUS SHIPS.
CUMBERLAND
1500
PENSACOLA
TOURVILLE
ASHIGARA
1000
500
TRENTO
PROPULSIVE MACHINERY WT.
WEIGHT - TONS.
PROTECTION WEIGHTS.
5 SPEED - KNOTS. 10 15 20 25 30

FIG. 1

This law which holds for all types of machinery, with slight modifications imposed by practical considerations, may be stated as follows:

In similar machines the weight varies as the cube of the linear dimension, the output varies as the square of the linear dimension and, therefore, the weight per unit output varies directly as the linear dimension.

One of the conditions of similarity is that the rate of working remains the same.

In the reciprocating engine this rate is called piston speed. In the gun it may be taken as a factor which bears the same relation to shots per minute that piston speed bears to revolutions per minute.

The conclusion from these assumptions would be that the rate of fire would vary inversely as the caliber. As a matter of fact all evidence supports the conclusion that a materially higher "piston speed" is possible with an 8-inch gun than with an 11-inch gun.

The tables of British and foreign ordnance in Brassey indicate that the rate of fire of the 8-inch gun will be about two and one-half times that of the 11-inch gun.

With a conservative figure of two, the comparison between the main batteries of the most heavily armed Washington treaty cruiser and the *Ersatz Preussen* would be as follows:

	Ersatz Preussen		*Pensacola*
Relative battery wts.	1.53	:	1.0
Ratio of powers	1.00	:	1.28
Ratio of power per unit wt.	1.00	:	1.96

In view of the impossibility of providing protection sufficient to resist the direct impact of an 8-inch projectile, without making a sacrifice in speed which would remove the ship entirely from the cruiser class, the decision made by the Washington Conference would seem to have been a sound one. In view also of the practical unanimity of the treaty powers as to the number of guns, and the importance of the space factor, the compromise of the U. S. designers on nine 8-inch guns would seem to represent a decision not open to revision.

The Speed Question

The weights of the hull are fixed; when reduced to the minimum necessary for strength and seaworthiness they cannot be changed. If the battery weights are assumed to be established by the adoption of a main battery of nine 8-inch guns, the problem is resolved into the determination of the distribution of the weight remaining between speed and protection.

This involves a determination of a weight schedule, a matter of some difficulty since there is so little authentic information available. Two estimates have been found which seem to be sufficiently accurate for the purposes of this discussion.

One of these made by a German writer, comparing a British cruiser with the *Ersatz Preussen,* was published in *Werft Reederei Hafen* of February 7, 1929. The other was given by Mr. James L. Bates of the Bureau of Construction and Repair in a discussion before the 1927 meeting of the Society of Naval Architects and Marine Engineers. These estimates are as follows:

	Ersatz Preussen	*Cumberland*	U. S. Cruiser
Hull	3,600 tons	4,300 tons	5,100 tons
Protection	2,700 tons	2,000 tons	1,000 tons
Engineering	1,600 tons	2,300 tons	2,300 tons
Ordnance	1,700 tons	1,000 tons	900 tons
Equipment	400 tons	400 tons	700 tons
Total	10,000 tons	10,000 tons	10,000 tons
Water	40 tons	380 tons	—
Fuel	3,500 tons	3,460 tons	—

There are certain inconsistencies in the above table, but those which are material are probably due to different methods of weight classification. In the British and German ships there are very material items of machinery carried under engineering which by the American practice are divided between Construction and Repair and Ordnance.

It is known that in all of these ships a very considerable amount of the protection is in the form of special-treatment steel worked into the hull structure, but it is not known how this is classified in the weight schedule between hull and protection weights. Based on the above the following schedule has been adopted and put into a form better suited to the purpose:

Fixed weights	
Hull	4,500 tons
Hull fittings	500 tons
Fixed engineering weights	400 tons
Equipment	400 tons
Total fixed weights	5,800 tons
Battery weights	1,300 tons
Balance	2,900 tons

In the above schedule the item of fixed engineering weights was arrived at by mak-

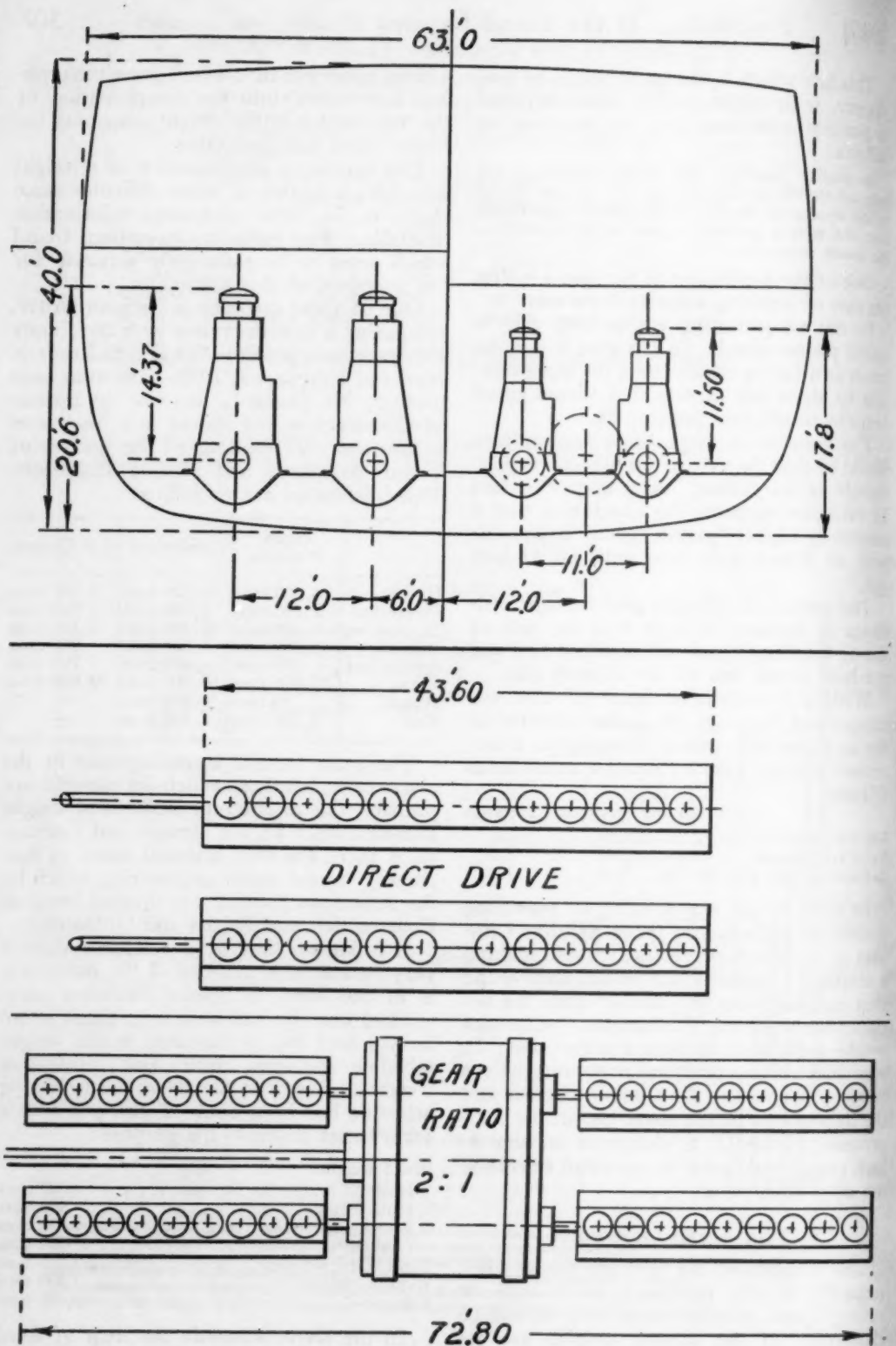


FIG. 2—Comparison of direct drive and geared drive for 50,000 S.H.P., using similar engines.

	Direct	*Geared*		*Direct*	*Geared*
Cyl. diam.	20.0 in.	16.0 in.	R.P.M., eng.	378	473
Stroke	25.0 in.	20.0 in.	Propeller	378	286

ing an estimate of the weight which would remain in a steam-driven 10,000-ton cruiser, after all machinery for propulsion, and all auxiliaries and fittings necessary to its operation, are removed. This item includes all engineering auxiliaries for ship service, and a weight sufficient for all engine exhaust pipes in a Diesel installation. The item for hull weight is liberal, when compared with the *Ersatz Preussen,* and is sufficient to include aviation and other miscellaneous weights. The item for ordnance is that estimated for nine 8-inch guns, eight 5-inch guns, and the ammunition for both.

Based on the above schedule the curves shown on Fig. 1 have been plotted showing the relation between propulsive machinery weights and protection weights for various speeds. These curves are based on the power curve on Fig. 5, and a weight for steam propulsive machinery of 36.0 lbs. per S.H.P., which is very close to that of existing installations, after the fixed engineering weights are deducted.

The points on the protection-weight curve do not pretend to be the weights for the ships indicated, but the weights resulting from the above schedule at the designed powers of those ships.

The increasing penalty paid for speeds above twenty-eight knots is apparent.

The protection-weight curve vanishes at thirty-six knots. Between the two extremes, the *Trento* and the *Ersatz Preussen,* the protection-weight increases from 380 tons to 2,070 tons, a matter of 445 per cent, for an increase of 25 per cent in speed. A happy mean would seem to have been found in the *Pensacola,* but protection which does not protect is useless, and if, by establishing the speed at thirty-three knots, insufficient protection to withstand the guns of a destroyer has been obtained, the weight involved might better perhaps have been applied to speed.

The traditional American policy, first established in the frigates of the War of 1812, has been that regardless of other factors our ships should be superior in fighting strength to those of a possible enemy. This policy, as has been so clearly pointed out by Theodore Roosevelt in his *Naval War of 1812,* was a very large factor in the successes won in single-ship actions during that war. The advent of steam and armor did not change the situation, and with the design of our first battleships of the *Indiana* class, this policy was restated, and was adhered to up to the time of the laying down of the first 10,000-ton cruisers. If this policy is a sound one an inspection of Fig. 1 would seem to suggest that the speed should be somewhere near thirty knots. It is quite possible that when the effect of the *Ersatz Preussen* is evaluated the speed may be lower. For the purpose of this study a speed of thirty-one knots will be assumed. The power required will be, from the power curve on Fig. 5, 80,000 S.H.P.

The Problem of the Engine

The only engine designed or building today which it is possible to put into a high-speed cruiser is that of the *Ersatz Preussen.* It is quite necessary, therefore, before considering the possibilities of larger powers, to make a critical examination of the known facts. The official information, released in January, 1929, was meager, being confined to the statement that the total power was 50,000 and the weight per B.H.P., 8 kilos–17.6 lbs. Since that time, however, information from various sources has reduced the matter to the status of an open secret. There is little room to doubt that this installation consists of eight 9-cylinder engines driving two shafts through gearing, runs at a piston speed of about 1,575 feet per minute, and, except for a general lightening of the frame and cylinder construction, that it is of the same type as the previous designs of high-speed engines built at Augsburg. The ratio of stroke to bore is probably about 1.25, although the poor economy indicated by the official statement suggests that it may be less. With this data it is possible to give the probable characteristics as follows:

Total power	50,000 S.H.P.
Number of cylinders	72
Power per cylinder	694
Piston speed	1,575 ft. min.
Brake M.E.P.	75 lbs. per sq. in.
Mechanical efficiency	90%
M.I.P.	83 lbs. per. sq. in.
Cyl. diam. 400 mm	16.00 in
Stroke 500 mm	20.00 in.
R.P.M.	473
Wt. per S.H.P. main engines	17.6 lbs.
Scavenging wt. per S.H.P.	4.0 lbs
Total engine wt. per B.H.P.	21.6 lbs.
Wt. of gearing per S.H.P.	4.0 lbs.
Wt. of engine and gears S.H.P.	25.6 lbs.
Engine weights	570 tons
Wt. of shafting and propellers	100 tons
Wt. of ship service machinery	400 tons

Total engineering wts.	1,070 tons
Wt. per S.H.P. total	47.9 lbs.
Wt. per S.H.P. propulsive mach.	30.0 lbs.
Wt. per cu. in. cyl. vol.	3.10 lbs.

The estimate of the total engineering weights based on an allowance of 400 tons, for the fixed auxiliaries under the Bureau of Engineering, is 530 tons short of that given by the German writer in *Werft Reederei Hafen.*

With the weights of the various items of machinery carried under Construction and Repair and Ordnance, including such weights as those of the steering gear, anchor hoists, boat hoists, ventilating motors, and turret and ammunition hoist machinery, the total might easily amount to as much as 570 tons.

A comparison of the weights of the Augsburg submarine engine with the high-speed two-cycle double-acting Berlin engine affords a check on the specific weight of 3.10 lbs. per cubic inch of cylinder volume. These two engines run at about the same piston speed, the same relative M.E.P., and represent about the same stage in the development of its type.

The weight of the Berlin engine is about 60 per cent greater than that of the submarine engine, per cubic inch cylinder volume.

Applying this ratio to later designs of four-cycle engines in which the specific weight has been reduced to 2.0 lbs. per cubic inch cylinder volume, the result for the two-cycle double-acting engine would be 3.2 lbs., which is very close to that estimated for the *Ersatz Preussen.*

There has been a disposition to explain the results of the *Ersatz Preussen* by assuming that they must be due to something new in the field of Diesel-engine design. *The Engineer* stated after the first information was released, "As the lastest M.A.N. engines of which we have cognizance have a weight of 55 lbs. per B.H.P., it is clear that the design of the new Admiralty type must possess some very novel features, the disclosure of which will be awaited with keen interest by the engineering world."

As a matter of fact this decrease to about one-third of the weight of the previous type can be very simply accounted for by the combined effects of a reduction of about 25 per cent in the specific weight, an increase of about 25 per cent in the piston speed, and a reduction of about 43 per cent in the stroke.

The effect of this last factor, which follows from a consideration of the law of similitude, has not as yet found its way into any textbook on marine engines, so far as I know. The following editorial statement from *Engineering* of December 20, 1929, may therefore be of interest:

> The laws of similarity indicate that in corresponding conditions, the engine weight per horse power should be directly proportional to the cylinder diameter, and at a meeting of the Institution of Mechanical Engineers, held in 1914, Sir Dugald Clerk exhibited a diagram in which the engine weights of internal combustion engines, plotted against the cylinder diameter showed a truly remarkable agreement with this theoretical deduction.

DIRECT OR GEARED DRIVE

This is a subject upon which there has been some confusion of thought, when applied to the problem of Diesel drive.

In slow and moderate-speed ships there are manifest advantages in using a number of small—and light weight—engines geared to slow propellers. As we go to higher speeds, limitations on propeller diameter force a progressive increase in the revolutions. When we reach the speeds of the 10,000-ton cruiser we are forced to use a speed of revolution for the propellers equal to that of a high-speed Diesel.

Since there can be no speed reduction there is no possible use for a reduction gear.

Somewhere between the extreme limits there is a point where any advantage due to the lower weight per B.H.P. of the small units disappears, and where the materially larger horizontal space required by the geared drive becomes prohibitive. This requirement of greater horizontal space is due, not to the gears alone, but to the fact that regardless of the size of the units the horizontal projection of the cylinders, in similar engines, is the same in all cases. It is obvious that a large number of small cylinders of the same total area, will with the necessary passages take up more space than a smaller number of large ones.

On Fig. 2 a comparison is shown between a two-shaft geared drive and a four-shaft direct drive, for an installation with the same total power as that of the *Ersatz Preussen.* The engine shown is the Berlin engine reduced to a stroke-bore ratio of 1.25.

The engines shown are exactly similar—that for the direct drive having been drawn by applying a factor of 1.25 to the linear dimensions of the smaller geared-drive engines.

The comparison is therefore an exact one. An estimate of the weights of the two installations is as follows:

	Geared drive	*Direct drive*
Engine wt. B.H.P.	17.6 lbs.	22.0 lbs.
Scaveng. wt. B.H.P.	4.0 lbs.	4.0 lbs.
Gearing wt. B.H.P.	4.0 lbs.	— lbs.
Total wt.	25.6 lbs.	26.0 lbs.

The weight of the shafting and propellers will be materially less for the direct drive, since the total power is the same, and the propellers will have materially better conditions due to the lower tip speed for the same disc area.

It is evident that in the *Ersatz Preussen* there has been no saving in weight by the use of the geared drive, and that for the gain due to decreased height a very heavy price has been paid in the greater horizontal space required.

The Solution for 80,000 S.H.P.

It must be obvious that, for powers greater than 50,000 S.H.P., the direct drive with four shafts must be used. The maximum number of cylinders on one shaft, justified by precedent, is twelve. There is no valid reason why a greater number cannot be used, but in this case twelve are sufficient.

The power per cylinder will be 1,040, and with an engine similar to that of the *Ersatz Preussen* the cylinder diameter will be about 25 inches. Since no engine of this size, running at the high piston speed required,

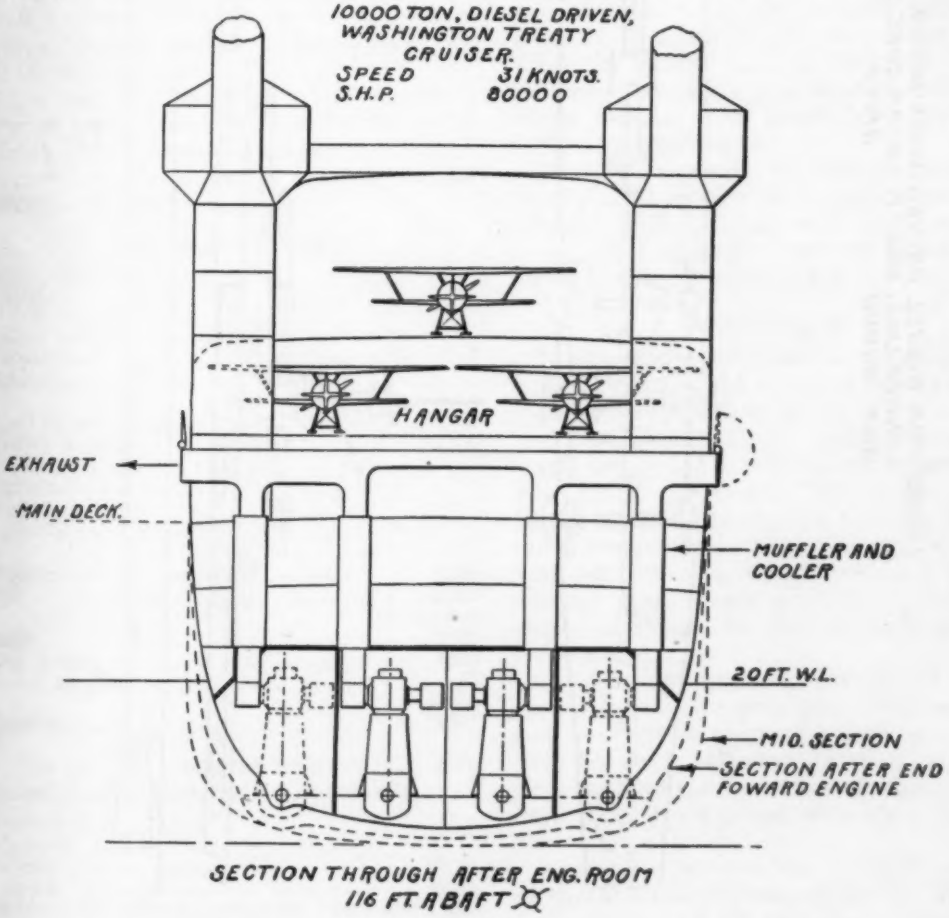


Fig. 3

10000 TON DIESEL DRIVEN, WASHINGTON TREATY CRUISER
LENGTH, LW.L. 600 FT. BEAM 60 FT. DEPTH 40 FT.
S.H.P. 80000 SPEED 31.0 KNOTS.

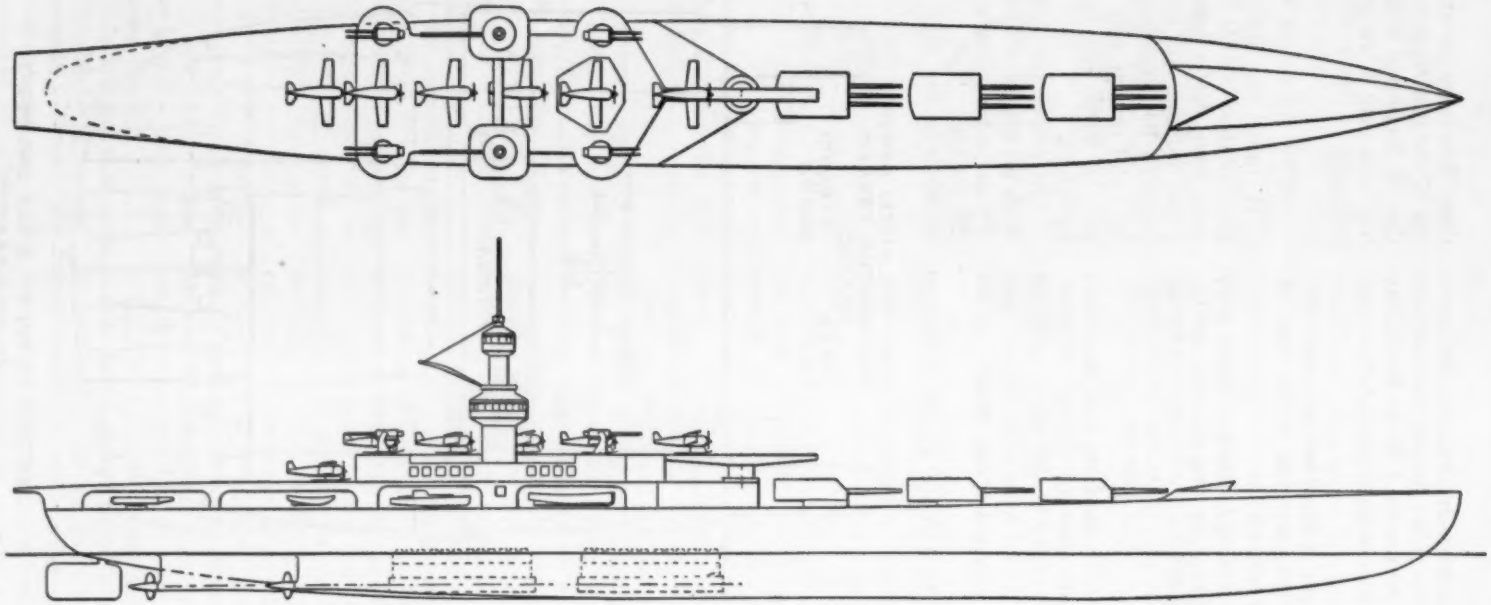


FIG. 4

has been built as yet, the question might well be asked as to what extent the engine of the *Ersatz Preussen* can be used as a precedent for the larger engine.

As far as the dynamic stresses are concerned there is no question but that it can be done. If similarity is adhered to the unit stresses will be precisely the same in the large engine as in the small engine.

The most troublesome factor in Diesel-engine design does not, however, follow the law of similitude. The heat stress depending upon the mean cylinder temperature, which is a function of the mean indicated pressure, varies directly as the thickness of the cylinder walls. These stresses increase directly as the cylinder diameter.

They do not increase with the piston speed, but rather tend to decrease; and since there are many engines in service with higher values of mean indicated pressure, and with cylinder diameters up to thirty-three inches, there is not the slightest room for doubt on this score.

The two sketches, Figs. 3 and 4, show a type of cruiser made possible by the use of Diesel drive. Based on the results attained in the *Ersatz Preussen*, the following weight schedule should be possible:

(All weights in tons)

Fixed weights		
Hull	4,000	
Hull fittings	500	
Ship service mach.	400	
Equipment	400	
Aviation	150	
Total fixed weights		5,450
Battery weights		1,300
Engineering weights		
Engines	929	
Scavenging wts.	107	
Shafting and propellers	160	
Total propulsive mach. wts.		1,196
Protection weights		2,054
Total		10,000
Fuel weight		3,500
Water weight		50
Total displacement		13,550

The general characteristics of the ship shown in these sketches are as follows:

Dimensions
- Length, L.W.L. ..... 600 ft.
- Beam ..... 60 ft.
- Depth ..... 40 ft.

Battery: nine 8-inch guns, eight 5-inch guns, and one quadruple torpedo tube

Machinery: four 12-cylinder, 2-cycle, double-acting engines
- Cylinder diameter ..... 24 inches
- Stroke ..... 30 inches
- R.P.M. 320
- Brake M.E.P. ..... 80 lbs. per sq. in.

Aviation, twelve airplanes, six of which are stowed in hangar.

Boats: two 40-foot motor launches, two 35-foot motor boats, and two 20-foot motor lifeboats.

The engines shown have practically the same over-all dimensions as those of the Augsburg engine of the same stroke and bore. A slightly higher piston speed and a materially higher mean indicated pressure have been used. This is justified by the use of the loop scavenging system of Tartrais, which, with the same length of effective stroke, permits a port area about 70 per cent greater than that of the Augsburg engine.

In the engines of the *Ersatz Preussen* the ratio of the effective stroke to full stroke will be about 0.70, with a mean indicated pressure of about 83 lbs. per square inch. With the system used by Tartrais, under the same scavenging conditions, an effective stroke ratio of 0.78 should be possible at 1,600 feet piston speed.

Under these conditions, since the mean indicated pressure possible is a function of the effective stroke, the possible value of the brake mean effective pressure should be about 83 lbs. per square inch.

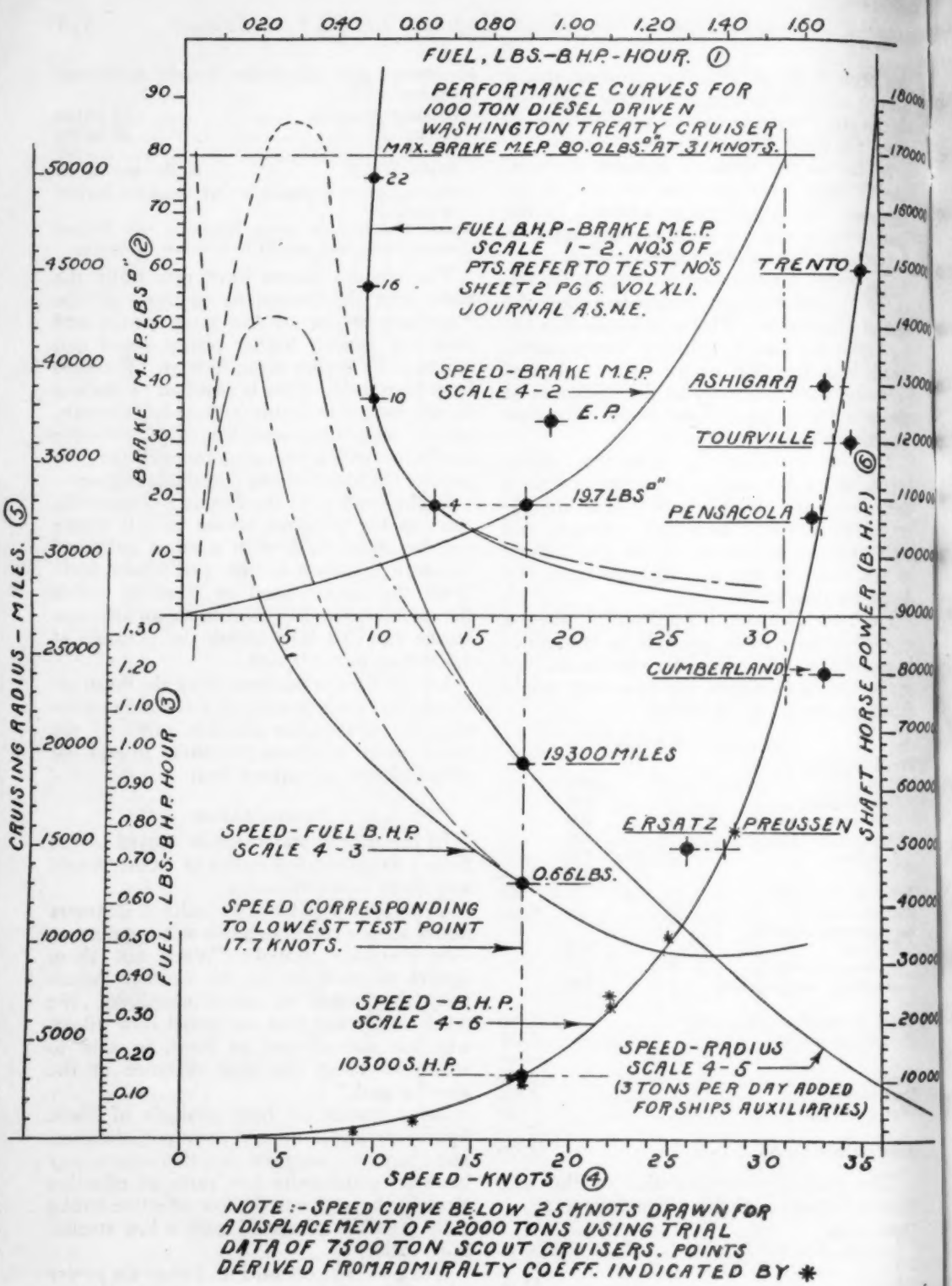
Performance

In the official statement in regard to the *Ersatz Preussen*, the radius at twenty knots was given as 10,000 miles.

Compared with known results of steamers under service conditions this was impressive. *The Engineer* stated: "Were not these figures vouched for by the German Admiralty, they would be almost incredible. We need hardly say that no vessel now afloat, whether man-of-war or liner, is able to steam anything like that distance at the speed stated."

As a matter of fact, analysis of these figures indicates a very poor performance, and if correct, suggests that this engine may have an abnormally low ratio of effective stroke to bore, due to the low effective stroke ratio possible, combined with a low stroke-bore ratio.

The power curve on Fig. 5 shows a power of 16,000 S.H.P. for twenty knots. With a fuel capacity of 3,500 tons results would be:


FUEL, LBS.-B.H.P.-HOUR. ①
PERFORMANCE CURVES FOR 1000 TON DIESEL DRIVEN WASHINGTON TREATY CRUISER
MAX. BRAKE M.E.P. 80.0 LBS.° AT 31 KNOTS.
FUEL B.H.P.-BRAKE M.E.P. SCALE 1-2. NO'S OF PTS. REFER TO TEST NO'S SHEET 2 PG 6. VOL XLI. JOURNAL A.S.N.E.
SPEED-BRAKE M.E.P. SCALE 4-2
E.P.
19.7 LBS°"
SPEED-FUEL B.H.P. SCALE 4-3
0.66 LBS.
SPEED CORRESPONDING TO LOWEST TEST POINT 17.7 KNOTS.
SPEED-B.H.P. SCALE 4-6
10300 S.H.P.
SPEED-RADIUS SCALE 4-5
(3 TONS PER DAY ADDED FOR SHIPS AUXILIARIES)
19300 MILES
TRENTO
ASHIGARA
TOURVILLE
PENSACOLA
CUMBERLAND
ERSATZ PREUSSEN
BRAKE M.E.P. LBS° ②
CRUISING RADIUS - MILES. ⑤
FUEL. LBS. B.H.P. HOUR ③
SHAFT HORSE POWER (B.H.P.) ⑥
SPEED - KNOTS ④

NOTE:- SPEED CURVE BELOW 25 KNOTS DRAWN FOR A DISPLACEMENT OF 12000 TONS USING TRIAL DATA OF 7500 TON SCOUT CRUISERS. POINTS DERIVED FROM ADMIRALTY COEFF. INDICATED BY *

FIG. 5

Endurance at 20 knots	20.83 days
10,000/480	
Fuel per day	168 tons
3,500/20.83	
Deduct for ship service	3 tons
Propulsive fuel per day	165 tons
Propulsive fuel per hour	15,400 lbs.
S.H.P.	16,000
Fuel S.H.P.-hour	0.96 lbs.

The fuel consumption curve of Fig. 5 is based on the shop tests of an ex-German submarine engine, as given by Mr. Philip Malozzi and Mr. John F. Fox, of the New York Navy Yard, in an article published in the *Journal of the American Society of Naval Engineers* for February, 1929.

These results, from an engine designed about 1914, show a minimum consumption, for conditions approximating those which might be expected in service, of about 0.48 lbs. per B.H.P. per hour. Since in recently designed two-cycle, double-acting, solid-injection engines fuel consumptions as low as 0.36 lbs. per B.H.P.-hour have been reported, the results shown on Fig. 5 must be accepted as conservative, even for an engine with the low stroke-bore ratio of 1.0.

The brake mean effective pressure for the *Ersatz Preussen* at twenty knots will be about 33.6 lbs. per square inch. This plotted against fuel per B.H.P.-hour (scale 1, Fig. 5), will fall at the point marked E.P. This is beyond all reason, and, even with the most extreme assumptions, it is evident that this ship will have a much greater radius than that admitted in the official statement. The radius indicated for the 31-knot cruiser at twenty knots is 16,700 miles. This is materially less than would be possible for a ship with a maximum speed of twenty-eight knots, owing to the lower value of the mean effective pressure, at twenty knots, of the higher powered ships. With the improvements in economy which have recently been made, and which are still being made, it should be possible to build a naval engine which, with all propulsive auxiliaries, would show a consumption of not more than 0.40 lbs. per S.H.P.-hour. With this figure the radius at 20 knots, with 3,500 tons of fuel, would be something better than 20,000 miles.

Conclusion

In view of the manifest advantages of the Diesel engine, it is a singular fact that, outside of Germany, there is no evidence of any serious effort being made to adapt it to naval use, outside of submarines, where its use was forced from the beginning due to the fact that no steam plant could be made to stand up under the exacting conditions existing on board that type. That the early submarines were unreliable is undoubtedly true, and it is probable that the memory of this fact, without a correct appraisal of the reasons, is very largely responsible for the distrust which still exists as to the reliability of the Diesel engine, in the face of overwhelming evidence to the contrary. All of the world's yachtsmen, and a majority of the ship owners outside of the United States, have found out that it is fully as reliable as the steam engine, and that it has intangible advantages fully as great as that of the low fuel consumption possible. These advantages in a naval vessel may be stated:

1. Greatly increased aëro capacity, without sacrificing gun power.
2. Better protection for machinery. Each engine is an entirely separate unit which can be entirely separated from the other units. The controls can be entirely separated from the engines, as has been done in the Hamburg-American, *St. Louis* and *Milwaukee*, and placed in a central compartment. Since the Diesel can be run under water, the flooding of a compartment need not put an engine out of action.
3. Better protection against gas attack. The induction air being taken from outside, the low heat of the compartments, containing water-jacketed engines, makes it possible to seal the engine compartments long enough to run out of any gas area.
4. Full speed available at all times.
5. Greater safety to personnel, due to absence of high-pressure boilers and pipes.
6. Greatly increased crew space due to the absence of the large boiler uptakes passing through the living spaces, and greatly increased comfort due to the absence of heat from boilers and steam pipes.
7. Economy of space. This is due to the fact the over-all length will be somewhat less and the athwartship dimensions will be very materially less. In the plan shown in Figs. 3 and 4 the total length of the machinery space is only 156 feet, and between the forward engines there is a space, between the fore-and-aft bulkheads, 90 by 26 feet.
8. The practically complete elimination of dependence on fuel ships, due to a radius at twenty knots equal to about six crossings of the Atlantic Ocean.

The Entering Wedge

By Lieutenant Commander Glenn Howell, *U. S. Navy*

IN THE Naval Institute Proceedings of December, 1905, there is an article "Early American Visitors to Japan," by Charles V. Stewart, listing the following early visits to Japan:

1797—Major Robert Shaw in a merchant vessel visited Nagasaki.

1799 to 1809—A number of other large vessels visited Nagasaki.

1837—The master of the American ship *Morrison* attempted to land shipwrecked Japanese sailors at Yeddo. He stayed in the harbor overnight but was fired upon and left in the morning unable to land the sailors. The same thing happened at Kagosima. He did, however, land at some outlying islands and introduced vaccination to them.

1846—The *Manhattan,* Captain Mercator Cooper.

1846—Commodore Biddle.

1849—Commodore Glynn visited Nagasaki shaping the way for Perry's visit.

I was a boy when my grandfather died, but I remember quite clearly his tale of the visit of the *Manhattan* to Japan. However, in spite of a fairly keen memory, I could never, after this passage of years, have recollected the details of this story had it not been for the fact that a half-century ago they were painstakingly set down. At that time grandfather reviewed the account and pronounced it in exact accord with the tale as he heard it from the lips of Captain Mercator Cooper of Long Island, his friend and shipmate in the grand old whaling days of the thirties.

This account was taken from the logbook of Captain Cooper. It was published in the Albany *Evening Journal* in July, 1876. When the editor of the *Journal* was offered the article, he said that he would like to publish it if he knew it to be true. The logbook was then submitted to the editor for inspection, and the article was published forthwith.

On the fourth of August, 1830, my grandfather sailed from Sag Harbor on his first voyage as a sailor in the ship *Phoenix,* Harry Green, captain, and Mercator Cooper, first mate. Grandfather's friendship with Mercator Cooper thus began. It continued through many years. The two met in San Francisco in 1849, and there Captain Cooper related the story of the visit to Japan of the *Manhattan.*

I append the account substantially as it was given in the Albany *Evening Journal.* It is the tale, insofar as I can determine, of the first visit to a Japanese port made by an American vessel and of course it antedates Perry's visit by nine years.

The first week in April, 1845, found the whaler *Manhattan,* of Sag Harbor, Captain Mercator Cooper, off St. Peter's, a small, uninhabited island a few leagues to the southeast of Niphon, runs the old account. Hoping to find some turtle on the coast, Captain Cooper hove to the ship and lowered his boat to examine the shore for this purpose. They coasted along the island and presently descried a boat of oriental appearance at the head of a little cove. To this they directed their course, and through a ravine-like opening in the hills they espied a hut some distance inland. They landed and walked toward the hut.

As they neared the wretched dwelling three Japanese issued from it and prostrated themselves before Captain Cooper, frequently touching the ground with their foreheads in token of their abject submission. The captain advanced and raised them up with friendly mien and signs, and presently eight others of the party timidly and reluctantly came from their hiding places. Their apprehensions soon yielded to the kindness of the captain. He ascertained that they had been shipwrecked upon this desolate isle and taking them to the shore he pointed to the *Manhattan* and offered to take them to Jeddo. When they finally grasped his in-

tent, they accepted the proposal with avid joy, immediately abandoned everything, and embarked aboard the whaler.

Aside from feelings of humanity, especially strong in those who themselves may at any time need assistance on the great deep, Captain Cooper not only possessed a strong personal curiosity to enter a port and behold the mysteries so long guarded from the gaze of the world but he hoped by this act of kindness to make a favorable impression upon the Japanese in respect to the civilization of the United States and its friendly disposition toward its distant neighbors across the Pacific.

These considerations led him to steer boldly for Jeddo notwithstanding the well-known regulations prohibiting the entrance of all foreign vessels into that sacred harbor.

As if to add emphasis to this errand of mercy, on the second day out from St. Peter's an object was sighted in the ocean, and the *Manhattan's* course was altered to examine it. It proved to be a dismasted Japanese junk in a sinking condition. The boats of the junk had been swept away in the gale which had dismasted the craft.

Captain Cooper boarded the wreck and informed the Japanese by signs that he would take them to their native land. No sooner was this offer understood than the shipwrecked sailors tumbled into the *Manhattan's* boats, to a degree apprehensive of the sudden submersion of the junk. With some difficulty Captain Cooper compelled them to return to their vessel and collect their clothing and other effects. Among the articles taken from the wreck were a number of Japanese books and a chart of Niphon and the adjacent island, about which more hereafter.

The junk was from the north of Niphon, loaded in bulk with salmon, salted, dried, and smoked, and was bound for Jeddo when overtaken by the storm. Shortly after her crew, eleven in number, were rescued, the craft foundered. In spite of Captain Cooper's obviously kind intentions, the Japanese distrusted him, and the captain of the junk spent the whole of his first night in the *Manhattan* alternately watching his own compass and the course the ship was steering.

When land was made the ship was found to be considerably to the north of Jeddo. However, Captain Cooper deemed it expedient to land with one of the Japanese, whom he dispatched to Jeddo to inform the Emperor of his intended visit to the capital to deliver the men whom he had rescued and to obtain food and water and make the repairs necessary to enable him to prosecute his voyage. Here and all along the coast, indented with innumerable bays, he saw junks and smaller craft without number, all engaged in fishing. On the shore the people whom he met were either fishermen or of the lower classes of society. They appeared intelligent and happy, and they made no objection to his landing.

Captain Cooper returned to the *Manhattan* and sailed along the coast many leagues. He astonished his passengers by naming correctly the prominent headlands as they were passed. The names he, of course, ascertained from his own charts, which, however, were found to be far inferior in accuracy of detail to the one obtained from the dismasted junk.

A sudden and adverse change of wind now compelled him to stand well out to sea, and he was driven so far from his course that a week elapsed before he recovered a position near his former landing. Here he landed two others of his passengers and dispatched them to the Emperor with the same message previously sent, together with the reason for his detention.

With favoring winds he now again set sail for Jeddo, and in due time the *Manhattan* entered the bay, deep within which the city is situated.

At the entrance of the bay a barge from the port met the whaler. It was under the command of one who from his rich dress appeared to be an officer of high rank and importance. This personage informed Captain Cooper that the messengers whom he had sent to the capital had executed their errand and that permission to come up to Jeddo with his ship was granted him by the Emperor. He was directed to anchor for the night under a certain headland and to expect another interview on the following day. He obeyed these instructions.

The next morning dawned upon a curious scene. Advancing upon the *Manhattan* were seen hundreds of boats filled with armed men. Each boat, in shape quite similar to an old-fashioned flatiron, was propelled not by oars, but by a single scull

worked by two men. Such were the dexterity of the men and the power of their instruments that the boats moved with velocity. The officers in command of these invariably wore two swords and were dressed in magnificent array. Their tunics were embroidered on the back in various colors and bore amongst other devices replicas of the arms carried by the privates under their respective commands. While the sole weapons used were swords and spears, the latter especially were varied infinitely in shape of the headpieces. A book of the heraldry of the empire, taken from the sinking junk, served to throw some light upon this peculiarity of the Japanese army.

At last several long lines of these boats were formed, decorated with gorgeous banners and bristling with spears. These long columns were made fast to one another and to the ship by ropes and awaited the signal to advance. The *Manhattan* then hove up her anchor and amidst the glad shouts of the multitude of boatmen was towed up to a new anchorage within a few miles of the city.

With the Stars and Stripes floating above him, Captain Cooper remained at the masthead with his glass, taking note of all that transpired in the harbor about him and gazing eagerly upon the *terra incognita* within. A wall followed the coast line in both directions. Beyond this wall rose terrace upon terrace crowned with gardens and shrubbery and trees, and back of these huge cedars, firs, and pines clothed the mountain sides.

In addition to the fleet engaged in towing the ship, hundreds of other craft of all sizes and descriptions covered the bay. These were filled with natives manifesting a curiosity equal to that of their visitors to see the strangers from their antipodes.

The *Manhattan* upon anchoring was immediately boarded by crowds of Japanese of all ranks from the highest officials in scarlet and gold to beggars in rags.

But all levees were to be limited to the ship. Captain Cooper was at once informed that neither himself nor any of his crew would be permitted to land, and a naked sword drawn across the throat significantly intimated the result of an infraction of this order.

Through a Dutch interpreter who also spoke English sufficiently to explain his words, the captain replied to the officials that he had no intention of disregarding their customs or breaking their laws but that he wished to convince the Emperor and his subjects of the kind feelings entertained toward them by himself and the American people and government. He stated that in this visit he had done only what any humane captain would do in the rescue and deliverance of the shipwrecked sailors, and he requested a small spar and some vegetables in order that he might prosecute his voyage.

Captain Cooper's frank and manly bearing, as well as his personal kindness to the passengers, won the confidence and respect of the officials of the government and in particular of the governor of Jeddo. During the captain's stay this dignitary treated him with distinguished courtesy and consideration. Years later the governor during a visit to New York as one of the principal members of the Japanese embassy made particular inquiry as to Captain Cooper's welfare. The Japanese seamen who had been taken from the desolate island and the wreck had no words to express their gratitude on parting from their preserver and embraced his knees with many tears.

The prohibition to land was no paper blockade. On the first morning after the anchoring of the ship, the spectator soon saw that there was a well-ordered plan developing in the movements of the hundreds of boats moving restlessly about in the harbor. About a hundred feet from the ship and perfectly encompassing it a line of boats was formed and lashed together, their sides touching one another and their sterns toward the *Manhattan*. Inside this circle was stationed a large junk, in which were the officers of the guard. Outside of these boats, at a distance of a hundred feet, was another circle of boats, not so numerous, and beyond this at an equal distance was a third circle, still more scattered. Each circle was made complete by passing around from boat to boat a hawser to which they were all fastened.

A thousand boats filled with men in gray uniforms, gorgeous banners of strange and unknown devices, and thousands of lances, naked and glittering in the sunlight or sheathed in lacquered sabres, made a brilliant spectacle by day, and transparencies and lanterns in countless numbers and of all fantastic shapes, weaving with the motion

of the waves, furnished a still more brilliant scene at night.

Within that cordon of boats floated for the first time in those waters the American flag. The civilizations of the East and the West, the Old World and the New, confronted each other as they had never done before.

The character and rigor of the guard surrounding the ship was at one time accidentally put to the test. Desiring to make some repairs to one of his boats, Captain Cooper ordered it to be lowered into the water preparatory to taking it on deck. Observing the movement but not understanding the design, the Japanese on board immediately drew their swords. The officer in command of the deck guard appeared greatly alarmed at the procedure. He remonstrated kindly but with great earnestness and he declared to Captain Cooper that not only would the Americans be slain if they left the ship on any pretext but he and his guard would lose their heads if this occurred. However, when the object of lowering the boat had been explained the Japanese with exclamations of relief restored their weapons. The officer in charge at once relieved the American sailors of their labors and commanded his own men to take the boat on board and make the necessary repairs.

During his stay Captain Cooper had many conversations with the governor of Jeddo and other persons of high rank. In one of these the whole subject of the entry of the *Manhattan* into their harbor was discussed. Captain Cooper was informed by the governor that the only reason for his being allowed to remain in the waters of Japan was because the Emperor felt assured he could not be a "bad-hearted foreigner" from the fact that he had come so far out of his course to restore to their homes poor people who were total strangers to him. He was repeatedly told that the Emperor "thought well of his heart" and that he was "good-hearted" and that consequently orders had been promulgated to treat him with marked attention and supply all his wants. The day before his departure the Emperor sent him his autograph as the most notable token of his own respect and consideration.

Some curiosity was manifested concerning the route he intended to take upon leaving Japan. The captain explained that he intended to make the port of Petropaulowski on his route to the whaling grounds. The governor's countenance became grave, and he grew more serious when the course was traced around the Cape of Good Hope and up the Atlantic to Amsterdam. It would not answer for this foreigner to sail away from the sealed ports of Japan—nay, from the capital itself, closed to all nations —to vaunt in foreign countries of his hardihood and success. This political mistake must be guarded against. The Emperor even must be consulted. As a consequence of these events an open letter, without signature, was given to Captain Cooper to be exhibited wherever he might go, and particularly in Holland, apologetic in character and explaining the circumstances of the visit and the reason for the imperial permission for strangers to enter the harbor of Jeddo. The letter was in the Dutch language. A translation is here given:

> It has come to our hearing from the mouths of shipwrecked persons that the shipwrecked people of our country have been brought home by these people and have been treated in the ship in a friendly manner. Now it is our law that such persons should not be received from the hands of foreign countries except China. But by (the hand of) these men alone are they received, because the bringing home of these shipwrecked persons arises possibly from ignorance of the aforesaid law. Thus in the future they will absolutely not be received, but must be treated with strictness in case they are brought in. The which you will please understand and make known to others also.
>
> That "provision, firewood, water" from the long time spent on the voyage are scarce upon the ship—this is heard and these things are granted.
>
> Upon receipt of this order the ship must speedily depart and not remain near by this land but actually return to its own country.

In the course of these conversations the governor of Jeddo multiplied his injunctions upon the captain that he should never repeat his visit to Japan under pain of greatly displeasing the Emperor. "But what would you wish me to do again under similar circumstances?" asked the captain. The governor was somewhat disconcerted by this question, hesitated, and at last, shrugged his shoulders, evaded a direct answer by repeating the injunction to come there no more. The probable truth is that the Emperor and the ruling classes both, at that time, would have preferred to have the shipwrecked sailors left to their fate rather than admit their rescuers, if foreigners,

within their harbors. We do not conceive there was any such grandiloquent exaltation of the empire and the imperial family as prevailed among their neighbors of the Celestial Kingdom and a corresponding deprecation of all aliens as outside barbarians. It was merely the traditional dislike of strangers, which had only too good a foundation for its existence, still rankling in their hearts and shaping their policy.

Still, to their credit be it recorded that the governor of Jeddo, with the concurrence of the Emperor, did not present to Captain Cooper the abandonment of sailors in distress as the only alternative. The captain assured the governor that if ever again he met with Japanese unfortunates upon the deep he would rescue them and supply them with food and whatever was necessary for their comfort. He then inquired what further he should do with them. The governor replied: "Carry them to some Dutch port, but never come to Japan again."

The *Manhattan* remained at Jeddo four days, during which time the captain received supplies of wood, water, rice, rye, and vegetables of various kinds, among which were enormous radishes as long and large as a man's arm. Presents were given of the lacquer ware used on the table by the Japanese and also of various articles of curiosity to the Western World. For all these presents, provisions, and some needed repairs to the ship, remuneration was refused.

But when the governor was informed that the ship was sufficiently recruited and ready for sea but that adverse winds prevented her departure, this latter fact seemed no impediment in the mind of that official. He had the same unlimited resources at his back as those employed by the pyramid builders of Egypt. At this juncture, therefore, the governor notified Captain Cooper that on the morrow he would have the ship towed a distance sufficient to gain an offing.

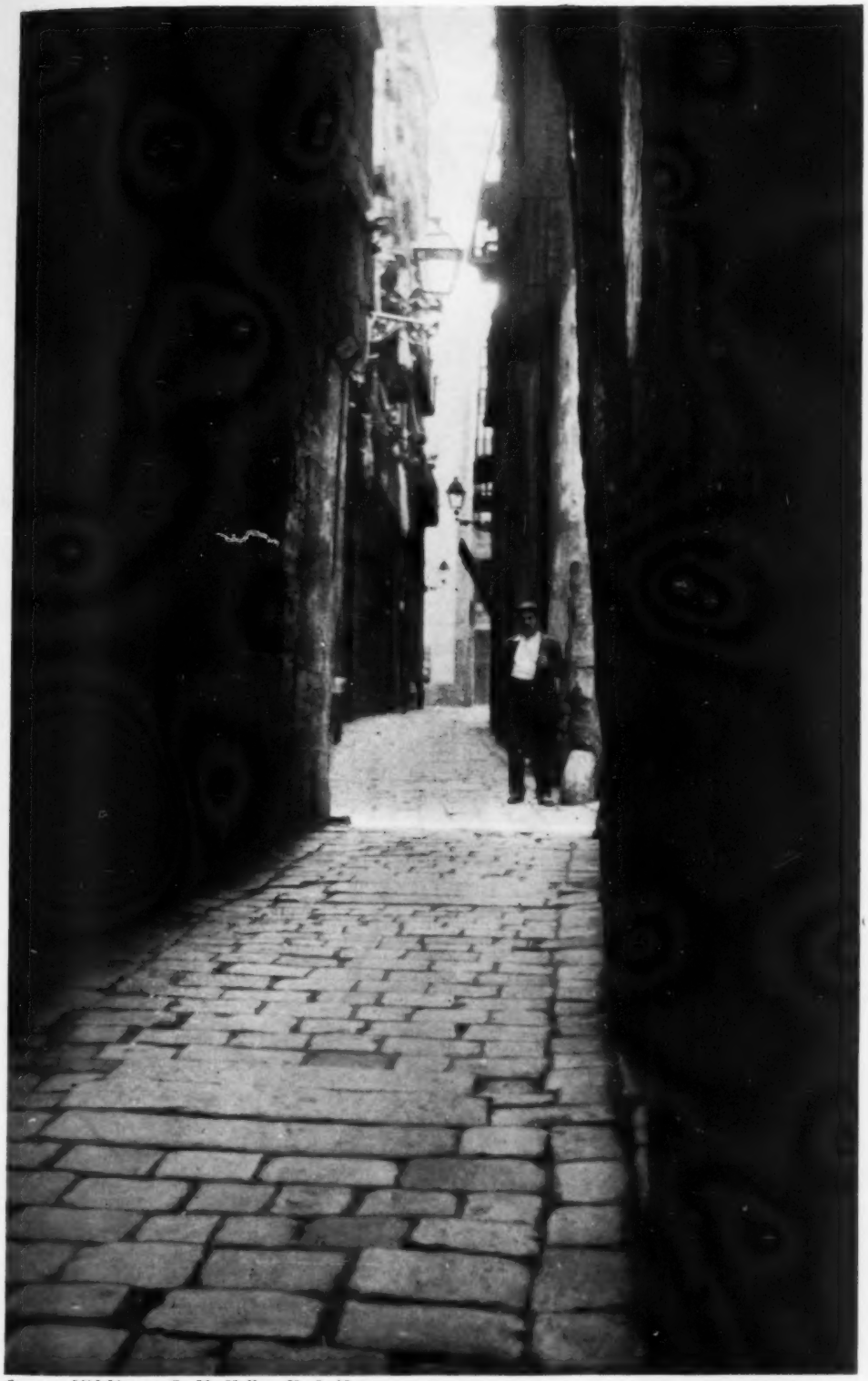
On the next morning there was witnessed a stirring scene. A more brilliant spectacle is rarely seen than that afforded in the movements of those squadrons of boats as the guard circles were broken and they wheeled into line, four abreast. They extended far out into the harbor. Hundreds of craft of all sizes, filled with curious spectators and gaily decked with flags, hovered about the bay. It was a carnival upon the deep, a spectacle never to be forgotten. High above all those gay banners gleamed the Stars and Stripes of the Western World.

At last the long procession was perfected, the anchor was weighed, and the *Manhattan* began to move through the water toward the mouth of the harbor. It was probably the first time a ship was sculled to sea. In this manner the whaler was towed for twenty miles. Captain Cooper, having obtained a good offing, then declined further assistance, the long line of boats cast off and turned their prows homeward, and the Americans with cheers long and loud made sail.

The chart before alluded to was a wonderful affair. As has already been intimated, it was found upon comparison with the coast line to be much more accurate than those on board the *Manhattan*. It was about five feet in length and three in width, and it exhibited not only the different provinces, about sixty in number, in different colors, and the towns and cities, but it also showed the natural features of the country, mountains, hills, valleys, and rivers, the latter traced with all confluent brooks to their sources. The relative sizes of cities and towns were indicated by figures of various shapes; and all, even to the smallest villages, were named, of course in Japanese characters. The residences of the various governors of the provinces, as well as other public establishments, were delineated, enclosed in figures of different shapes and coloring. Even the tracks of the coastwise trade from Jeddo to all the principal ports of the empire were carefully laid down.

Overtures were made to Captain Cooper by a representative of the British government for the purchase of this chart, but the captain signified his intention to offer it first to his own country. With this object in view, on his return to America he went to Washington, but the officials whose duty it was to place the chart in the archives of the nation were at loggerheads with each other, and after several vexatious experiences the captain left the city in disgust, taking the chart back to his Long Island home.

Soon after this it cost our government $30,000 to secure a chart of the coast from the Dutch. This chart was put into the hands of Commodore Perry at the time of his visit for opening negotiations for a treaty of friendship and commerce with the United States.



Courtesy Midshipman G. M. Holley, U. S. Navy

A STREET IN SPAIN

A photograph taken in Barcelona on the cruise of 1929.

UNIV. OF MICH.

By Ewing Galloway, N.Y.

SUNSET

By Burton Holmes from Ewing Galloway

GIBRALTAR

This port was visited on the midshipmen's practice cruise of 1929.

U.S. NAV. ACAD. LIBR.

Courtesy Midshipman G. M. Holley, U. S. Navy

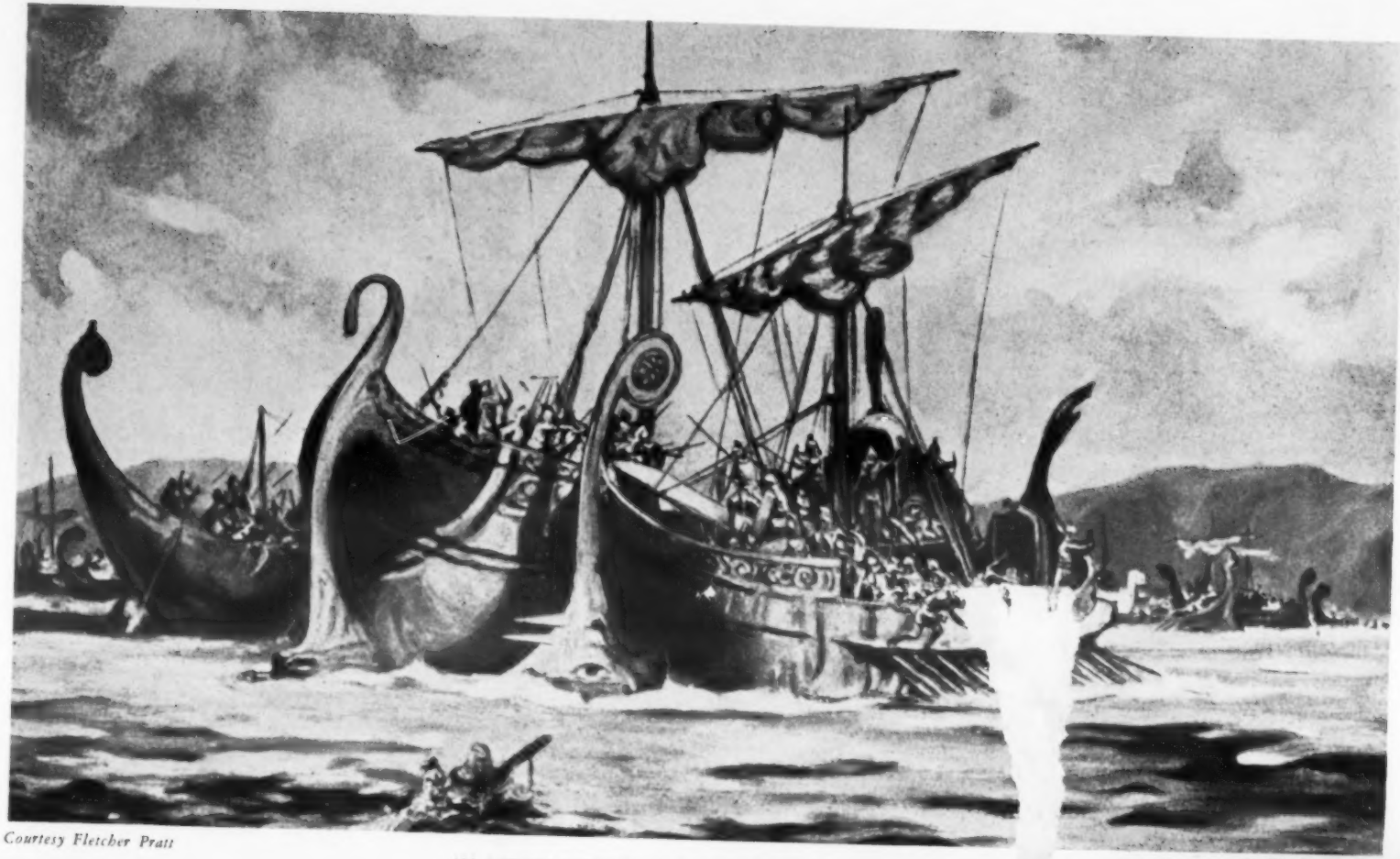
RUINS OF POMPEII

These ruins were visited by many of the midshipmen.

Courtesy Midshipman G. M. Holley, U. S. Navy

THE COLOSSEUM, ROME

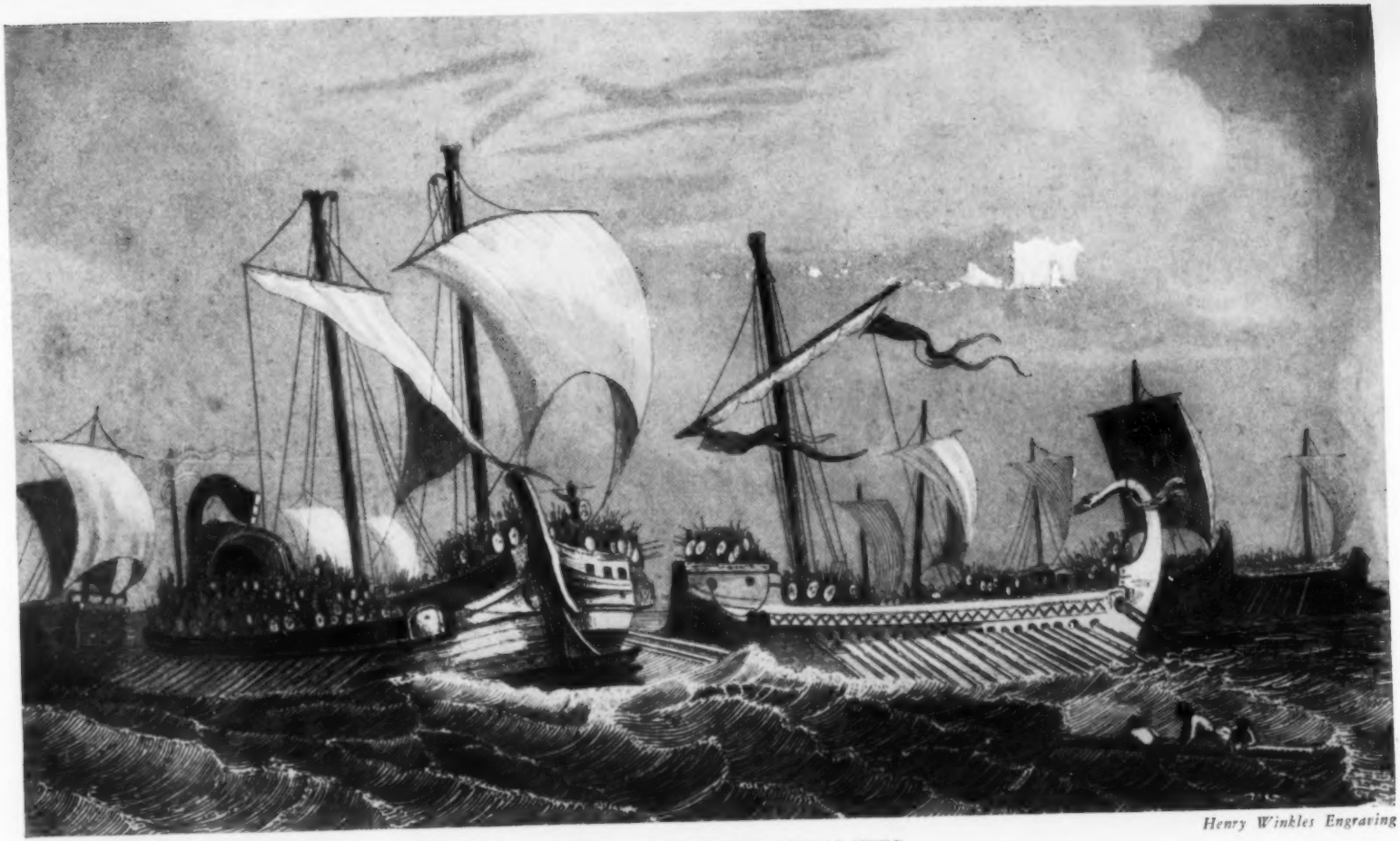
Parties of midshipmen and bluejackets visited Rome on the cruise of 1929.



Courtesy Fletcher Pratt

AN ACTION BETWEEN A PENTECONTER AND A BIREME

By W. E. Wigfull

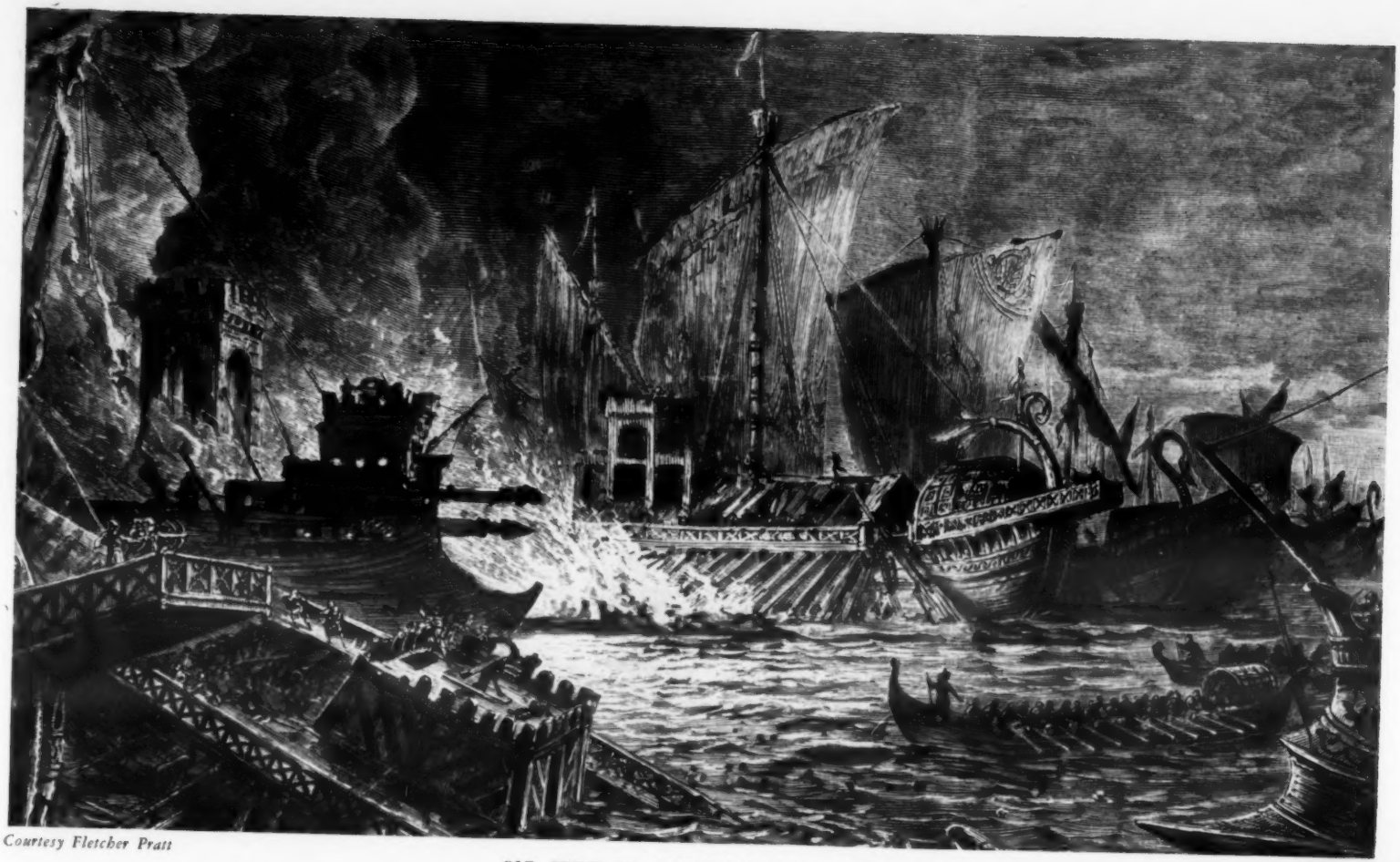


Henry Winkles Engraving

Courtesy Fletcher Pratt

"BATTLESHIPS IN ACTION," ROMAN STYLE

The big ship in the left foreground is drawn too blunt in the bows; most Roman vessels had fine lines. The ram is of the characteristic Roman form.



Courtesy Fletcher Pratt

OLD PRINT OF A ROMAN NAVAL BATTLE

This picture by an unknown English artist illustrates unusually well the type of ships and the mass tactics used.

The First Cruiser Campaign

By FLETCHER PRATT

THE campaign of Cnaeus Pompey against the pirates in 67 B.C. has an importance far beyond its outward significance as an event. It marked the birth of four new concepts of the first importance. Two of these were political, two military, and three of them, under the influence of success, crystallized into institutions.

In the political, or rather, politico-military, field, the pirate campaign was the first occasion when the entire armed strength of a nation was called out for mere police duty. As it was also the last and only instance, it need not detain us further than as the subject of a remark on the curiosity of the occurrence. But the campaign was more important as being the first time the Roman democracy, the proudest and up to this time the most successful in the world, confessed that it could no longer rule itself and turned over the direction of state affairs to one man on the condition that he give them good government. There had been dictatorships in Rome before—Scipio, Marius, and Sulla all tried it—but they did it with armies at their backs and treated the republic as a captured city. In Pompey's case the impetus came from within; the Romans themselves cheerfully set up a military dictatorship and placed him at the head of it. In view of the present world trend toward the same institution the point is not without interest.

On the naval side the innovations brought about by the pirate campaign were not less striking. It was the first recorded occasion on which cruisers were used, and the first use of the convoy system. There were light ships before Pompey, but they were used as light battleships; there were convoys before, but they were military convoys; cases in which (as in the movements that resulted in the battles of Mylæ, Ecnomus, Syracuse) a battle fleet had been used to cover the voyage and debarkation of an army. Pompey's innovations were using light ships as cruisers and grouping commercial traffic in small fleets and protecting it against a raid or casual encounter with a cruiser force.

But before entering upon the subject it is necessary to examine the background of a campaign so fruitful in new ideas. In the first place it must be borne in mind that the Romans were, for a people of outstanding military tradition, singularly inept in naval matters. Caius Duilius had put to sea with an improvised fleet and won a stunning victory in the First Punic War; and it was Rome's misfortune that she never forgot it. To the Roman mind it always seemed that a fleet which could overwhelm any possible enemy could be conjured out of nothing when needed. This misconception more than once brought her to the edge of disaster, and long years after, was to plunge her into it.

Under the republican army organization Roman citizens were divided into five classes. Only the men of the fourth and fifth grades (the poorest) were liable to be called for duty with the fleet. These were archers and javelin men, light armed, with a leather cap, a round leather targe, and no armor. They were poor alike in fighting quality and discipline. The Roman fleet was normally commanded by a *quæstor* (about equivalent to a commodore) with headquarters at Ostia. After Marius reformed the military establishment, even this shadow of a naval reserve was wiped out, and Rome was left dependent for a navy on subject cities (like Massilia, Smyrna, Rhodes) and her few "naval colonies" (Ostia, Castrum Novum, Pyrgi, Antium, Terracina, Rhegium, Velia, Paestum) each of which was to furnish a fixed number of ships and marines on call from the consul of the year.

By Marius' time the Roman power had become so overwhelming that these contingent ships more than sufficed to supply the need of a battle fleet. And one was needed very rarely, only on occasions when it was

wanted to cover the transport of an army. Once this was secured the fleet was disbanded; a Roman army was supposed to be able to shift for itself under all circumstances. But the Romans never sent men by sea when they could help it. Marcus Cato, that self-satisfied prig, wrote down in his old age three things in his life that he repented, and first on the list he placed the fact that he had sent some troops around from Cartagena to Gades by water, when he might have marched them overland—fifty miles further and through a range of mountains!

As to light ships and the use that might be made of them, the Romans had no idea. Their peace treaty with Macedonia after their victory over Perseus provided that he should surrender all his ships up to quadriremes—that is, all his fleet but the battleships! Rome had no doubt about being able to deal with a hostile battle fleet, but clearly regarded the problem of light ships raiding her sea communications as an insoluble one. Nothing more clearly points out the otherwise incredible fact that cruiser warfare was unknown before Pompey.

So much for the naval background. The historical and personal background was this:

Sulla, from the height of his dictatorship, had just reorganized the Roman constitution. The old aristocracy of virtue had disappeared, worn out in the wars and by the plague; he hoped to substitute for it an aristocracy of talent which should restore the declining respect for law. If Sulla had been lucky enough to find an able successor, a leader who would subordinate self to the state, to play Jefferson to his Washington, he might have succeeded. He thought he had the man in young Cnaeus Pompey, who had brought the campaign against butcher Marius to a brilliant conclusion. But Pompey's first act on getting home was to drive a horse and cart through the new constitution by demanding an official triumph denied him by law. Sulla, seeing he had been mistaken in his man, but that it was now too late to keep Pompey from the first place in the state, gave him the triumph and retired to a bitter old age and death with the sure knowledge that his labor had been in vain and that Pompey would throw down everything he had set up.

This was Pompey's first essay in what he did all his life long—make use of the talents of able men, collect all the credit for himself, and then kick over the step by which he rose. But his very vanity and selfishness aided him; he could not bear that anyone else should tackle difficult jobs from which credit might be won; and he would not tackle any job without having the best of means at his disposal and the best of abilities to second him. In his younger days moreover (before arteriosclerosis and Julius Caesar cramped his style) he was exactly of the type that makes a good officer—energetic, quick of perception, thoughtful of his men, tirelessly on the go.

He had need of all these qualities as soon as old Sulla died. With the master's hand off the wheel the Roman Empire began to head for the rocks. Sertorius gathered disgruntled elements about him and raised a dangerous rebellion in Spain, beating the local military forces. Pompey at once dashed to the spot of danger, leaving things at Rome to shift for themselves.

They shifted for themselves very badly. Italy was even less self-supporting than now; Rome was fed from the cornfields of Sardinia, Sicily, and Egypt. The ships that carried the corn were large sailing vessels, round and very slow as compared with the current warships. They were ideal game for pirates—completely defenseless and loaded with the commercial traffic of an empire—all the jewels, statues, tax remittances, and rich travelers going to Rome, besides the valuable corn consignments themselves. Piracy had been a flourishing institution in the Mediterranean since Homeric times, and it now reached new levels. There was nothing to keep it in check. Rome, by Sulla's treaty with Mithridates, which deprived that last rival to her power of a navy, had been left the one sea power in the world, and she was simply refusing to police the seas. The pirates had been enormously strengthened by that same treaty with Mithridates, for the King of Pontus had sent his navy to join them and whispered in the proper quarters that he would back them up if it came to a jam. Moreover, the proscriptions of Marius and Sulla had driven many Romans themselves, with their fine courage and their flair for discipline, into piracy.

The total result was piracy on an unheard-of scale. The marauders kept to light, fast ships and handled them well. Once in a while an annoyed Roman general would trot out a few quinquiremes and chase them; where-

upon they ran away, laughing. It was like sending battleships to chase destroyers; a quinquireme could make high speed over a short distance, as in a battle, but the weight of the big oars soon tired the rowers in the upper banks unless they went slowly. As the pirates' confidence in their invulnerability increased, they grew bolder and bolder. After one of the futile punitive expeditions they sailed into Ostia and actually burnt half the Roman fleet in Rome's own naval arsenal. They captured and sacked Cnidus, Samos, Colophon (important cities all), and raided the great temples of Samothrace and Delos which had stood sacrosanct through all the wars of five generations. Just as Pompey was leaving for Spain a pirate band captured the praetor Bellianus on his way out to command the Army of the East and walked him down a plank into the ocean.

The last blow was too much. An expedition was fitted out at Ostia, placed in command of a good old bull-headed Roman soldier, Servilius Vatia, and sent to smoke out the pirate nests in Cilicia. Servilius Vatia burnt all the Cilician cities he found and crucified all the pirates he could catch, which were not many. Their swift ships had already outrun him and sought other refuge.

Hence the pirates were a serious nuisance at the time Pompey left for Spain. They were disorganizing commercial sea traffic, and Pompey and the Senate wrote complaining letters back and forth about it. In the second year of the Spanish command, there was actually a lack of corn in Rome. Pompey's appeals for supplies from home were met with the news that the city did not have enough for itself. In his third year, the municipal corn doles were discontinued and people died of starvation in the richest city in the world; and they were not all poor people, either.

At the other end of the line, Pompey, that man of quick perceptions, was being taught by circumstances the value of naval power. Sertorius beat him in battle, and tried to cut off his supplies; Pompey retired on Saguntum, where his small fleet was stationed, got plenty of supplies, and defied the Spaniard. He marched out, lost another battle, and again retired to the cover of his fleet, ready to take the offensive as soon as the pressure let up.

This was no doubt instructive and the lesson was rubbed in when the pirate chieftains (backed by Mithridates from the other end of the Mediterranean) opened negotiations with Sertorius, offering to hoist his standard and provide him with a navy that would give him the upper hand of Pompey, once for all. Pompey heard about it and wrote a letter of such flaming indignation to the Senate that that supine body was stirred into action for long enough to call up all the contingent squadrons and back their commander in Spain with the full force of the Roman battle fleet—a strength against which the pirates could not hope to make head. But they continued to raid his provision ships, and Pompey was finally forced to take the eminently correct measure of drawing his supplies from Sardinia and convoying his supply ships with fighting vessels. All this is important because Pompey applied later the lessons he learned in Spain.

In Pompey's fourth year in Spain, thanks to the dexterity of his subordinate Metellus and the opportune assassination of Sertorius, the campaign came to an end. The commander took ship for Rome and met bad news. The city was literally starving. The richest homes were on reduced rations; the Egyptian corn ships had stopped altogether; the Sicilian vessels just skulked across the straits to Neapolis, sending their supplies overland, and even these supplies were cut off by the presence in southern Italy of an army of revolted slaves and gladiators. Worst of all, the praetor Antonius had been sent against the pirates in Crete with a fleet and an army and had lost both. The pirates gathered in his rear and cut off his provision ships. When he landed on the island to get food for his men, they descended on the fleet he had left insufficiently guarded on the beach and burnt every ship, after which they merely sat still till he was starved into surrendering. For the second time in Roman history a Roman commander and Roman army were sold into slavery. It was a blacker day than even those of the Punic war.

This was the condition of affairs when Pompey, after a little political thimble-rigging, got the Gabinian law passed. The law, proposed by the tribune Aulus Gabinius, made Pompey consul for three years, and gave him as his province the whole shore of the Mediterranean for a distance fifty miles inland. It practically placed

the whole empire under martial law and made him the supreme commander. To put down the pirates, he was granted four hundred ships and ten legions—a force which can be imagined when one realizes that Cæsar was given only four legions for the conquest of Gaul, and Scipio took only three to Africa for the death duel with Hannibal. It was a levy *en masse*. Nor were these the usual "naval soldiers" of the fourth and fifth classes; they were the Roman heavy infantry, the best troops in the world.

The first thing the new commander did was to build a fleet (as the Romans built their ships of green wood, this offered no practical difficulties) and the fleet he built differed from all others in containing a large number of light biremes and penteconters, carrying fifty to a hundred and fifty rowers, and about half as many fighting men. For the battleships—the quadriremes, quinquiremes, and so on—he continued to depend on the Rhodian and other contingent ships. Meanwhile, he organized his forces. Twenty-four senators, who had all held the highest military commands, were recalled to service as his lieutenants. Metellus, his old Spanish aid, was sent to Crete with orders not to leave one stone upon another in the whole island.

As soon as the fleet was ready Pompey set to work on the immediate problem, which was to loosen the pirate blockade. The western Mediterranean was divided into four districts, and cruiser fleets based on Massilia, Ostia, and Cartagena were to scour the coasts in every direction. Aulus Gabinius was sent to Syracuse with a powerful battle fleet to close off the straits and watch the coasts there. Pompey himself, with a squadron of his new light ships, went to Sardinia at the center of the web, and flung out an arm of an expeditionary force to the Balearic Islands. From Sardinia he saw to it that no corn ship sailed without proper naval escort, and then divided and subdivided his new light ships down to ones and twos to hunt out every detail of the coasts.

There was no danger in this. The pirates, like the Roman marines of the pre-Pompeian navy, were light armed; they could not stand for a moment in battle against the Roman legionary, on whose shields their javelins would not bite and whose heavy helmet their one-edged swords would not even dent. Single-ship encounters were sure to be Roman victories. When they combined against one of Pompey's cruisers, it retired on the next of the cordon, and the two on the next, until the pirate squadron was soon faced with a force as fast as itself and ten times as powerful.

With these efficiency methods Pompey combined propaganda. He offered life and a plot of land to the pirate crews who surrendered their captains. Some of them tied their officers up and came in; their ships were promptly added to the Pompeian fleet and the captains were crucified. In forty days, so effective was the method, the western end of the Mediterranean was cleared, and the Sicilian and Sardinian corn ships flowing to Rome in an uninterrupted stream under their naval escorts exorcised the demon of famine and set the populace shouting for the military ruler.

Forty days—and it was all over and Pompey turning toward the eastern seas. Here the problem was more difficult. The Aegean Islands were all robbers' roosts and the pirates had a strong base in Cilicia, where they could get plenty of help from their friend Mithridates. But Pompey followed the same system, varying only the details. He established nine bases for his cruising squadrons (Ravenna, Corcyra, Alexandria, and Rhodes were four of them, the others unidentifiable) and sent around instructions that every ship was to keep constantly at sea unless damaged. The technique of hunting down the marauders was varied to the extent of sending the cruisers out in small groups instead of ones and twos. The Oriental pirates were both more likely to concentrate and more determined to fight than their western brethren.

The Illyrians gave the Ravenna fleet a tough battle and some of the heavy ships had to be sent up the Adriatic to help out. The Alexandrian squadron's duty was largely confined to convoying the Egyptian corn ships. Pompey himself hurried to the Aegean to base himself there as he had on Sardinia. Off the Greek capes a Corinthian vessel ran in with the news that the pirates were concentrating a big fleet to wipe out his cruiser squadrons in detail. This was just what Pompey wanted, though it is difficult to see what else the pirates could have done.

Pompey handled the next phase of the

campaign very cleverly. He dispatched a galley manned by picked rowers to hurry up Aulus Gabinius with the battle fleet from Syracuse; another one went to Rhodes to beg the Rhodians to get their last available man and ship afloat; and every kind of craft that would float at Tarentum was loaded with legionary soldiers to fill up the cruisers and Rhodians and make them invincible on the day of battle.

The Rhodes cruiser squadron, to which the best and fastest ships had been assigned, was sent to keep in touch with the pirate concentration, allowing them to gather as much as possible, but discouraging spreading out by snapping up any strays. The pirates, however, had little intention of dispersing. King Mithridates sent them officers and provisions, and they imagined they would have nothing to deal with but one or two of Pompey's light squadrons. They gathered off Mount Taurus, and as the Roman battle fleet neared them the net around them was tightened. The light ships cut off their stragglers and hustled them together, keeping them from getting any information about the Roman movements. Metellus, from Crete, blocked off the Aegean so that there should be no leaks by way of Mithridates.

Finally, one pirate vessel was allowed to get through. It took their fleet the news that Pompey had landed a force at Anticragus and that the town had surrendered at discretion. Thinking to catch him disorganized with his ships perhaps drawn up on the beach, the pirates swept down toward the city, and off Coracesium, as the cruiser squadron they had been facing drew to one side and another, they came into the presence of the whole might of the Roman fleet.

There was no escape. The heaviest quinquireme, once as close as this to the enemy, could outrun as well as outfight the light ships, and Pompey had now concentrated plenty of light vessels as well. Seeing there was no help for it, the pirates made the best stand they could, which was not very good. They were boarded, captured, burned, and sunk on all sides. It was a victory more complete than Trafalgar. Very few escaped at all, and these were rounded up in the next day or two by Pompey's cruisers.

The battle over, the Roman soldiers were landed along the coast in a dozen places at once and such of the Cilician hill castles as did not surrender were taken by storm. In ninety-one days from the time he embarked at Ostia Pompey had cleaned up the pirates for good and all. And as he was reëmbarking to go and deal with sly old Mithridates, a despatch boat arived with the news that what was left of the Cretans had made unconditional surrender to Metellus. In all, Pompey disposed of about 800 pirate vessels —not a bad record for 400 cruisers.

To put the crowning touch on the campaign Pompey kept his word about settling the surrendered pirates on land of their own,

taking care to plant the colonies far from their original haunts. Virgil, who saw one of them at Tarentum in his youth, has left us the last record of the pirate campaign.

But its echoes rang through the rest of Roman history—indeed, are ringing yet. Pompey never forgot the value of sea power or of cruisers. When Julius Cæsar attacked him, Pompey in Epirus let Cæsar cross the Adriatic, and then came down on his communications with the navy he had developed. All through the bitter winter weather Pompey's ships kept the sea, cutting off Cæsar's reënforcements and provisions, and by virtue of these cruisers, Pompey was enabled at Dyrrhacium to inflict the only defeat on Cæsar that that greatest of commanders ever received. Not until Cæsar in turn had learned the lesson that the master of the world must first be master of the sea did he win; and when he did win he transmitted the lesson to Octavius, so that Octavius in his turn armed himself for the conquest of the world with a fleet. And it was the cruisers of Octavius that blinded Antony's great fleet and lured it on to destruction at Actium, thus leading up to the foundation of the Roman Empire.

Better Iron Men *for the* Navy

By COMMANDER L. J. GULLIVER, *U. S. Navy*

IT IS interesting to test and weigh the capabilities of the men of the Navy of 1929, compare the results with what we know of the crews of our men-of-war in the days gone by, and thus ascertain how far we have progressed. It is customary to refer to those former men—now gone to the place where all good sailors go—as "iron men," leaving the inference that the Navy sailormen are now of some softer metal or of something still softer and less durable, namely, wood. This inference we can say with entire surety is absurd.

From what is known of the Navy's men in the War of the Revolution and the War of 1812, it is safe to write them down as very considerably lacking in American origin; as being willing to fight in many instances only so far as they were driven to it or led by hard-bitten officers; as patriotic in many cases as the prospect of prize money can create patriotism; and as possessed of only enough intelligence to ram home round shot into the business end of smooth-bore guns. Not much was expected of the Navy's men in those days and not much was given them in comparison with the direct and indirect emoluments of today.

However, the Navy's first men were at least as able as their rivals; they had about as much ability as their jobs demanded and if they had had more intelligence and better educations, they would have found no employment for them on the gun decks of the frigates.

One hundred years ago, officer supervision from the quarter-deck encompassed every ship activity; today, petty officer supervision and responsibility is necessarily utilized in manifold ways below and above decks and the so-called iron men therefore have gone out of the Navy, their places being taken by men capable of applying the forces of electrical and mechanical science on board ship. With the advent of these new forces, it may be asked whether the Navy has sought and obtained the men to make these new instruments effective? On the theory that in the long run men fitted for jobs always fill them, the answer must be yes.

It is interesting to see how the change from the iron man to the man-of-war's man of 1929 has come to pass in the crews of our ships. This change has been gradual—in step with the progressive adoption of the mechanical and electrical inventions suited to naval welfare—gradual, it should be said, up to seven or eight years ago when regulations governing the acceptance of applicants for enlistment in the Navy were rather radically changed. These regulations encompassed an entirely new kind of naval recruit —mentally and morally a naval man who resembled in no way the famed iron man.

In drawing up these new regulations, emphasis was placed on the heavy money losses that had come about from the enforced elimination before the end of their enlistment of men who were incapable of doing the work demanded by our mechanical and electrical Navy. Influencing the new regulations was the force of public opinion which had grown to be a factor to be considered; fathers and mothers were unwilling to have their sons while immature in years undertake naval careers, and in answer to this feeling, Congress enacted legislation requiring written consent of parents. This requirement, however, had previously been operative in naval recruiting as a matter of policy—as an aid in reducing preventable discharges and in providing the new recruit with the great advantage of moral support from home.

The new recruiting aimed at: (1) the elimination of, or at least the reduction of, losses both in money and naval efficiency arising from discharges other than honorable; (2) the procurement of recruits who possessed the mental and moral fiber necessary to do the Navy's work well; or to put this in other words, to keep out the ineligi-

bles and unworthy applicants and to seek the kind who were able to prove their worthiness on investigation, prior to enlistment.

In actual practice, it has been found harder to bar the unworthy applicants than to effect the enlistment of good men. This is another way of saying that we have not sufficiently learned how to say "no" to unworthy applicants; we have not fully got on to the curves of those applicants, who putting their best foot forward, sneak into the Navy when they really should be rejected. It is not always easy to detect the ineligibles; it is easy to recognize the good men.

There has always been a considerable amount of misinformation in the service, and elsewhere, regarding the procurement of recruits for the Navy—misinformation arising from lack of service interest in this vital phase of ship personnel; hence the survival of old beliefs concerning enlistment methods —beliefs that were at best only partly true, a quarter of a century ago. To do away with misinformation and to substitute accurate understanding of those who constitute the newcomers to the ranks of the Navy would seem to be an essential first step in developing these men into efficient man-of-war's men and to applying the methods of leadership best suited to them.

Service lack of information was mentioned above. This can be understood when it is known that, following the change in recruiting methods eight years ago aimed at the procurement of quality recruits, there has been a succession of changes, following up the advantages gained and designed to improve still further the applicants for enlistment today. Tomorrow's recruit will have to be, and will be, an even better man than the one who is accepted at this writing. The vicious circle that once existed in recruiting—accepting men for enlistment only to see an unnecessarily large percentage of them discharged soon thereafter, has given way to a circle that continuously grows smaller—the better the recruit, the fewer the preventable discharges, the greater number of reënlistments and the fewer replacements.

Naval recruiting today has been rightly compared to the employment section of the highest class corporations. In fact, it can be doubted if there is a company in this country that, bearing in mind the money waste of hiring and firing men, surrounds the selection of its employees with the precautions of present-day naval recruiting. The results of these rigid methods have been important in: (a) reduction of heavy money losses arising from preventable discharges, i.e., underage, inaptitude, undesirable, medical, special order, dishonorable, and bad conduct; (b) reduction of the turnover in ship personnel, due to replacements of these losses; (c) increase in ship efficiency resulting from (b); (d) increase in the prestige of the Navy in the minds of the public.

Some years ago there was computed the money losses to the government from only one class of preventable discharges—namely, underage. The monthly totals—and they were not by any means inclusive of all the losses from this class of discharge—were very large. The transportation costs of shipping these underage boys from their homes to training stations and their eventual return home at government expense, alone amounted to a great deal of money. Similarly, the money waste arising from undesirable, inaptitude, bad conduct, and dishonorable discharges took a heavy yearly toll in dollars and cents. No one could accurately compute the loss due to the "masts," an institution without either honor or profit.

Naval recruiting has now definitely attained the dignity of selection. This has been made possible by the steadily decreasing number of recruits needed each year to maintain the Navy at authorized strength. To illustrate: this year the Recruiting Service will select 14,000 men; a few years ago the Recruiting Service enlisted 25,000 men. With 11,000 fewer men needed and the number of applicants holding steady, the particularity of selection goes on apace.

Now that selection of naval recruits is a definitely established fact, it would seem that the difficulties of recruiting would be a matter of history. Actually, however, the working of selection has proved vastly more exacting than the work of enlisting. Let us see why this is so.

The average recruiting station, with its three to eight substations, will have from 300 to 600 applicants a month. Incidentally, "labor" conditions have no effect or influence whatever on the number of applicants. From these applicants only one out of five will pass the medical officer's examination. Of those who do pass perhaps 50 per cent will, for various reasons, never be seen again. Thus, our four hundred applicants

are reduced to about fifty. To these the methods of selection are applied.

The first steps—the timesavers—are the procurement of positive proof of age and United States citizenship, and the investigation of police records. If these are defective, the time and expense of going further with the applicant are immediately eliminated.

Only in very rare instances is there any difficulty in obtaining positive proof of the applicant's age, and with it his American citizenship. In those few exceptional cases where the birth has not been registered as required by law, recourse is had to baptismal records, family Bibles, and in some cases the doctor who was present at the birth is searched out and interviewed. Where good evidence of birth cannot be obtained, there is good reason to suspect underage or alien birth, or both. Young men who are under the legal age of enlistment are unsuited for the Navy's work, even if they were not potential cases for discharge on presentation by their parents of evidence of their true age, which, incidentally, they invariably obtain. Underage applicants not infrequently present birth certificates which have been altered—some of them so well that only a magnifying glass will bring out the alteration. In other cases the applicant will offer a birth certificate of an older brother, or of a "friend." The requirement of definite proof of the applicant's age is in line with the employment methods of reputable industrial corporations.

Investigation of the applicant's police record provides a most interesting insight into human nature—an insight that avails not at all in detecting applicants with police records. These young men are almost invariably very innocent in appearance, as well as intelligent and well dressed. They always deny that they have ever been arrested and if you are a good judge of human nature you will believe them—only later to find that they have a police record as long as your arm.

Since the aim of the Navy's employment department is to select men who are mentally, morally, and physically qualified to do the Navy's work, it is necessary to ascertain by tests and investigation the applicant's education, intelligence, and working record. These, assuredly, cannot be taken for granted; neither can the recruiting officer accept as true the statements recorded on the written application form. Young men frequently credit themselves with one and sometimes more grades in school than they have completed, and they often state that they have "worked" for a year or more. These statements, "confirmed" by written certificates from their employers, turn out to be true in a sense—they have worked Saturday afternoons and after school hours. With these things in mind it is safe to proceed with an applicant only after giving him a reasonably devised intelligence test and making a personal investigation of his working record. These requirements are important. No lad, however strong physically or well intentioned, can do satisfactorily the work demanded of a modern man-of-war's man if his intelligence is such that the best he can do is to complete say seven grades in school at the age of fifteen. (The average age for graduation from grammar school—eight grades—is fourteen). Neither can it be expected that a young man who is unable or unwilling to get and keep steady employment can do the work required of him on board ship.

While on the subject of employer references, it is enlightening to know that one large railroad corporation in New England requires all applicants to answer this question, "What have you been employed at for the past ten years?" and then proceeds to check up on the answer. In this connection, how many men desert the Navy because they have become discouraged through facing work that is beyond their mental equipment and moral fiber? And how many "leave" through lack of mental perception of the gravity of their act?

The home conditions of the applicant must necessarily be personally investigated—to verify the identity of the lad; to make certain that his parents, and not someone else, signed his consent papers, and that these parents understand exactly what a Navy enlistment means; to ascertain if his parents are likely to be dependent on the applicant for support. Too many requests for special-order discharges have, in the past, been submitted—too many affidavits that are misleading.

Parents frequently unconsciously reveal to the recruiting personnel the unsuitability of their sons for enlistment. This happens when one or both parents "accompany" the boy to the office. I do not recall a case of

this kind that has not turned out to be a rejection for poor quality. A "regular" boy invariably makes his way to the station on his own initiative.

The raising of recruiting to its present place has brought about some striking economies, one of the most important of which is the reduced number of personnel necessary to select the station's monthly quota. One station that I know about had twenty-eight chief petty officers on duty in 1923. This same station now has only fourteen. At this station it is now rarely, if ever, necessary to furnish lodging and subsistence to accepted applicants; a few years ago, the cost of this feature was a very considerable amount. The accepted applicant today has his own funds and prefers to subsist himself. A few years ago the Navy paid the applicant's transportation from his home to the main station, so that he could be examined; now the applicant comes to the main station at his own expense.

Quality recruiting—careful selection of applicants—has proved decidedly successful. All stations now have waiting lists; no more is it necessary for the officer in charge to interview protesting and indignant fathers and mothers. Preventable discharges have declined to astonishingly low figures; Navy trade schools graduate the same number from a smaller number of entering assignments. Turnover of ships' companies have been reduced; the Navy has steadily arisen in public esteem; worth-while boys choosing Navy careers lead others like them, and better, to follow suit.

Public esteem and respect for the Navy and particularly for the men of the Navy increase as our people become informed of the high standards for enlistment.

It is good that the spreading of this information should go on. More than once the Secretary of the Navy has publicly emphasized his judgment as to the fine quality of naval personnel now manning our ships.

On January 2, in an address in Boston, the Secretary stated in substance that the enlisted personnel of the Navy was made up of men of high intelligence and of excellent character.

Quality recruiting pays.

The Interior Control Board

By LIEUTENANT COMMANDER R. B. CARNEY, *U. S. Navy*

AT THE time of submitting this article, the Manual of Interior Control has been approved by the Secretary of the Navy for issue to the naval service, and has been sent to the public printer. This publication will have an important effect on naval material, but as yet its scope and purpose are probably not generally understood. That can be immediately rectified by stating that the Manual of Interior Control will supersede the Reports of the Fire Control Board and the Ship Control Board. The two last-mentioned tomes require no introduction here.

It is not necessary to review the developments which led to the formation of a General Board to determine military characteristics of ships, nor can we go into historical detail concerning the trend of events which pointed to the understandable necessity for formulating principles of control in order that all ships might be best equipped to perform the tasks for which they are intended. A brief sketch of comparatively modern efforts to codify control principles will, however, be of interest and will serve to create a background against which the salient features of the Interior Control Board and its manual will stand out in clear relief.

The building and fitting out of any vessel of war to assume its assigned task necessitates intelligent and coördinated consideration of structural characteristics, operation requirements, special equipment, and innumerable technical factors mutually related. Prospective employment determines tactical, offensive, and defensive characteristics, and those are matters to be defined by the political situation, cost, strength of possible enemies, and the character of national possessions and trade. Once the type and strength of a ship have been settled, construction may commence, and it is at that point that a great need for coördination arises. This is the point of origin for the efforts of which the Manual of Interior Control is the most recent manifestation. Obviously some form of board or coördinating agency is necessary to harmonize the various activities engaged in designing and producing the parts of the ship and her armament, motive power, and devices for controlling her offensive and defensive equipment. Some standard must be defined if sound methods are to be obtained and the best operating conditions and military effectiveness achieved.

There have been two principal lines of endeavor in this direction in recent years: the work of the Fire Control Board and the Ship Control Board. The efforts of the various turret boards and turret safety boards may be said to have been subsidiary to those of the Fire Control and Ship Control Boards, in that they prescribed certain requirements to insure the maximum protection to personnel and material in turrets, mounts, and spaces in which ammunition is stowed and handled. The most recent publications dealing with fire control and ship control were the Reports of the Fire Control Board and Ship Control Board published in 1923 and 1924 respectively.

Originally, ship control and fire control were considered to be separate entities and were made the subject of separate recommendations; when turret material requirements were incorporated into the fire-control publication it was more to insure its being brought to the attention of the maximum number of officers than because turret specifications were considered as a proper part of the subject of fire control. It eventually became apparent that ship control and fire control could not be treated as unrelated and independent functions, and it was soon realized that much undesirable duplication resulted from tabulating the requirements of the two functions in separate volumes.

Furthermore, there were many phases of the two subjects that dovetailed, and changes in one publication either conflicted with the other, or else necessitated corrections in both books. It was necessary to state in the Report of the Ship Control Board, 1924, that where differences were noted between that publication and the Report of the Fire Control Board issued in the previous year, the more recent should govern.

The basic idea behind the reports of these two boards quickly proved its worth and found fertile soil in a service ripe for standardization methods. The forces afloat found the publications of value in checking up deficiencies in their installations and in organizing for battle; the staffs and certain shore activities found them convenient in passing judgment on requests for alterations; the material bureaus of the Department used them continually in acting on work requests and suggestions for new construction. There was, however, one serious defect in the books as they stood between the years 1923 and 1928: the boards had completed their work, signed their names, and published their findings and recommendations as reports. Not only does a report create an impression of unalterable finality, but these particular reports were so bound that corrections other than those of the most minor sort could not be made in existing copies. Furthermore, the organization of the two boards was such that the most trivial subject referred to them for action required extensive preliminary paper work and fuss before full consideration could be given the matter at hand. And lastly, after the full board had ponderously rendered its decision, that decision was extremely likely to languish in the files—certainly, the word was not broadcasted to the service at large.

By 1928 the clamor for some method of bringing the statement of fire-control and ship-control requirements up to date resulted in a thorough survey of the situation with a view to correcting evils which were hampering the entire establishment. The resulting study was of itself interesting, but must be passed over; the final conclusions, however, are pertinent and will be set down. They were to (a) establish a continuing board; (b) designate the chief of some division or office of the Department as ex officio president of the board; (c) appoint a permanent recorder with no other duties, at least until such time as the recommendations of the board were in final form, approved by proper authority, and published to the service; (d) revise and bring up to date the requirements of fire control and ship control, and combine them into one book; (e) designate this book as a manual; (f) publish the manual in loose-leaf form in order that the subjects of fire control and ship control might be kept alive and up to date; (g) secure as members of the board representatives from all the bureaus and offices concerned; (h) empower the board to call before it such personnel as might be necessary to insure obtaining the best possible information and opinions on any subject referred to the board for recommendation.

These preliminary recommendations met with general approval and formed the basis of the precept which formally created the Interior Control Board. The director of fleet training was designated as the senior member of the board, and the various bureaus and offices concerned were represented in the membership. An officer was appointed as member and recorder with no other duties than preparing a manual of interior control.

Before proceeding with the work, it was necessary to collect all past decisions of the old Fire Control and Ship Control Boards and list them for the future use of the Interior Control Board; that done, the board took up the question of the form in which the new manual should be presented. The form, arrangement of chapters, extent of detail, and similar problems were carefully considered in the light of instructions contained in the precept, and the general character of the publication was eventually settled. Once the chapterization was determined, the organization for carrying on the work was considered. Fortunately it was agreed without a record vote that full board meetings were more likely to produce conversation than results; consequently, the board was divided into workable subcommittees consisting of officers best fitted to handle the various subjects; a senior officer from the Division of Fleet Training acted as senior member of most of the subcommittees in order to facilitate matters and reduce lost motion, and the recorder served on each subcommittee to insure uniformity of effort and also to better carry out a time-

schedule plan. The senior member of the board rendered decisions and generally coordinated effort with the result that all chapters were in mimeograph form in remarkably short time.

Various interesting points arose in the preparation of the manual, one of which was the definition of "ship control." Previously, the navigating officer had been referred to as the ship-control officer, but when the board decided to go into the subjects of gas defense, stability control, and damage control generally, it was obvious that this definition of ship control required considerable thought. The board finally concluded that ship control was composed of two distinct parts: (a) maneuvering control, and (b) damage control. Damage control was further subdivided to include repairs, stability control, gas defense, care of the wounded, and kindred subjects. As a result of this new conception of ship control, the navigator is now considered to be the maneuvering officer, and the first lieutenant is designated as the damage-control officer. Quite naturally, the organizations of small ships will need to be modified somewhat in following the general plan of ship control laid down for capital ships.

In concerning itself with damage control, the board inserted an entering wedge which should greatly stimulate interest in, and study of, stability control, gas defense, and the other components of damage control. The science of equipping vessels to resist gas attack is as yet in its infancy, but the board has taken a good step forward in promoting study of structural gas defense. As time goes on, experience will dictate the corrections that must be made in the manual to keep abreast of development. (The writer has discussed this matter of gas defense in a former article published in the PROCEEDINGS.)

Since the completion of the Report of the Fire Control Board, 1923, aircraft operations, antiaircraft gunnery, and numerous other activities have advanced by leaps and bounds and it has become necessary to revise many conceptions and principles of control methods. All of these recent developments have been considered by the Interior Control Board with a view to formulating procedures and methods able to meet conditions as they actually exist today. The result is a compendium of the latest approved fire-control principles which cover matters of design as well as operation.

In laying down principles there is one evil which must always be guarded against; no one man should be allowed to thrust his pet ideas down the collective throat of the entire Navy. The board took every precaution against this contingency during the preparation of the mimeograph draft of the manual and the mimeograph form was then submitted to the forces afloat and to all shore activities concerned in order to provide an opportunity for the Navy in general to make comment and recommendation before the manual was issued. Many conferences and much discussion resulted, and the manual was a greatly changed little fellow by the time it had been subjected to the searching criticism of the fleet.

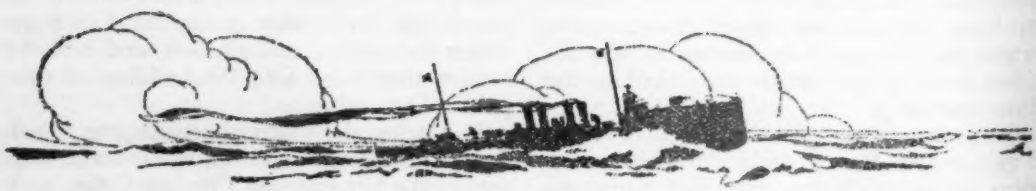
For example, in preparing the preliminary draft, a chapter was devoted to the "island" type of aircraft carriers. Great strides in carrier operations had been made in the fleet concentration just completed and there were no officers stationed in Washington qualified to speak authoritatively on the best and most up-to-date carrier practices. Writing that chapter then became more or less a shot in the dark based on such data as could be gleaned from all manner of sources. The chapter was submitted to the Aircraft Squadrons of the Battle Fleet for study, and was later discussed in great detail in conferences between fleet and board representatives. When all comments and recommendations were sifted, the net result was the closest possible approximation of a true cross section of the Navy's best opinion. The history of that particular chapter is the history of the manual; it would have been practically impossible to secure fuller or wider discussion, consultation, and consideration than went into the building of this publication.

Following the thorough revamping based on the comments received, the manual was sent to the Government Printing Office, and even while awaiting receipt of the proofs, last minute checks were made to insure the very latest information and recommendations being entered in the final product. The spring of 1930 should see the Manual of Interior Control in general use, with the machinery existent for continually keeping it in accord with the most modern developments.

The Interior Control Board followed the precedent of the previous Fire Control and Ship Control Boards in the matter of making rather general recommendations concerning topics which, owing to lack of available data, could not be made the subject of definite recommendation in the text of the manual. This permitted the board to delve into and discuss matters which normally might not be considered as coming within its purview. A most interesting example of this may well be cited at this point by way of illustration.

In the course of the preparation of the manual, it was noticed that not infrequently rather important points of design were settled more or less "out of school" by representatives of bureaus concerned. The conclusions arrived at were not necessarily correct, but nevertheless the work went ahead, and later corrective measures were adopted if the original decision was found to be unsound. It goes without saying that such methods are costly, but it must be understood that there was no culpability on the part of the people doing the work; such fault as existed lay with the system. Obviously, however, there was a need for coordinating and supervising planning effort to eliminate the possibility of one or two designers involving the Navy in expensive contracts the plans for which had not been subjected to the closest scrutiny by all concerned and recommended for approval by operating personnel as well as by designers. The Interior Control Board has taken a keen interest in this matter, and has successfully applied the principle of plans supervision and coördination to its own proceedings and efforts. It is now time to establish some regularly constituted agency, vested with the necessary authority, and charged with supervision of planning effort in order that *all* plans and changes in plans for new and modernized construction and alterations may be inspected with a view toward harmony with operating conditions and General Board requirements.

There is no point to going into further detail describing the proceedings of the board or the contents of the manual; the manual will be in general use shortly, and furthermore, the confidential nature of much of its contents prevents discussion in great detail. It is hoped, however, that this brief outline will serve to give some idea of the procedure of, and results accomplished by, the board which has succeeded to the responsibilities of the old Fire Control and Ship Control Boards.



The Growth *of* Standardization

By Lieutenant Commander D. P. Moon, *U. S. Navy**

Civilization and Standardization Progress Together

THE creation and use of standards have been the leavening powers by which man has risen from the primitive life of the first ape man to the highly complex life of the twentieth-century man. Such standards of great power in the development of civilization have been: picture writing, syllable writing, alphabet writing, phonetics, languages, social ethics, religion, laws, division of time, measurement, and money. In the rise of mankind there has been a parallel and corresponding development and use of standards. These standards are so important to civilization that if by some magician's wand all knowledge of their existence were wiped out the world would be returned to chaos and barbarism.

Even though the advancement of civilization is so inseparably linked with the growth of standards, until comparatively recent times no systematic efforts toward the formulation of rational, coördinated, and universal standards were attempted. Such a work is now being actively carried on in the field of industry. Despite the youth of this movement, the progress is so marked, and the benefits to industry so manifest, that some day the present period may be spoken of as the second "industrial revolution."

Notwithstanding the extensive accomplishments of this systematic standardization in the field of industry, the work has been carried on so quietly and so unostentatiously that but little is generally known about it. In the belief that some knowledge of this movement would be of interest this article attempts to set down very briefly a few of the steps in the growth of industrial standardization, and to enumerate some of the agencies engaged.

*Note: Recently a Bureau of Ordnance representative as a member of the National Screw-Thread Commission.

Localized Uncoördinated Standards

The needs and habits of individuals, families, tribes, and nations through the centuries have forced the development of countless haphazard and uncoördinated standards. These have been evolved at a gradually accelerating rate from the beginning of man to the modern industrial period as industry has progressively developed through the periods of the household system, the handicraft system, the guilds, the cottage system, and the factory period with its later developments in the use of steam and gas engines and electricity.

The early standards were local in character and consequently of limited application. Thus, the same industry operating in different localities in the same country had numerous local standards where one universal standard might have sufficed. Such a multiplicity of standards was a hindrance to business and a waste to both producer and consumer.

These facts have been recognized for many years but the resistance of large manufacturers, who had established standards of their own or who objected to the first cost of changing their product to conform to new standards, has until recently frustrated any general efforts at standardization. The World War had much to do with changing selfish viewpoints and now practically the whole world is standardizing as rapidly as the machinery and conditions will permit.

National Standardizing Bodies

In this undertaking twenty national bodies are engaged which were organized in the following sequence: Great Britain, 1901; Holland, 1916; Germany, 1917; United States, 1918; Switzerland, 1918; France, 1918; Belgium, 1919; Canada, 1919; Austria, 1920; Italy, 1921; Japan, 1921; Hungary, 1921; Australia, 1922; Sweden, 1922; Czechoslovakia, 1922; Norway, 1923; Po-

land, 1924; Finland, 1924; Russia, 1925; and Denmark, 1926. It will be noted that with the exception of England all these bodies date from or after the World War.

These national bodies all function in much the same way. Upon the request of a representative organization or a government department a conference of all those interested is called. If the opinion is favorable toward the creation of a new standard a committee is appointed to handle the work. The new standard is sent out in tentative form to those concerned and after discussion, trial, and necessary revisions it is promulgated.

U. S. Standardizing Bodies

So many organizations in the United States are now engaged in standardization work that but a few of the more important can be enumerated. The eight executive departments of the government with their bureaus and separate federal bodies are all actively enlisted. Of the numerous independent federal bodies, the National Screw-Thread Commission, and the Federal Purchasing and Specification Boards should be mentioned. The Bureau of Standards, under the Department of Commerce, as the name implies, is the leading governmental standardizing body. Hundreds of municipal, county, and state agencies are coöperating in formulating universal standards.

Of the larger standardizing agencies, the American Standards Association is probably the most important. Participating in the work through it are several hundred national organizations, technical, industrial, and governmental. Technical societies and trade associations to the number of approximately one thousand feature standardization as one of their main reasons for existence and are contributing their efforts to the movement of standardization.

Standardization in the Navy

The Navy has long been interested in many aspects of standardization. Several bureaus are represented on the most prominent associations, commissions, and societies. Among these is the National Screw-Thread Commission, existing by act of Congress, which has one representative from the Bureau of Ordnance and one from the Bureau of Engineering, as two of its eight members. The Navy Department standard stock catalogue dates its beginning in 1915. The latest edition is being used as a guide for a federal standard stock catalogue now in course of preparation. In addition to agencies for industrial standardization there are others under the Navy Department which, though perhaps not usually thought of as such, are engaged in standardization. Among these may be enumerated the Navy Regulations and other official publications, the Naval Academy, the Naval War College, the Postgraduate School, and the various service schools; the General Board; the various bureaus; the Naval Examining Board. These agencies fall under the heading of localized standardizing bodies.

Benefits and Dangers of Standards

There are those who claim that the post-war prosperity of the United States is due to standardization. These enthusiasts point to the savings in time and material, the savings through the reduction in the variety and quantity of stocks required, the broadening of the manufacturers' markets, the increased output per person, reduced costs, the uniform quality, and the simplification of replacements and repairs which accrue to the consumer, as being their reasons for such a belief. It is impossible to prove the accuracy of such a statement but those who are familiar with the subject agree that standardization has played a prominent part and that its possibilities have only been touched.

With all the benefits of standardization it has possibilities of harm. Unless those engaged in the work appreciate that a standard when promulgated represents nothing more than the best contemporaneous effort on the subject, and that it should be modified as better knowledge or practice is developed, standardization can result in the crystallization of practices which are not the best and progress may be stifled. This possibility can be reduced by making it as easy to revise a standard as to create it.

Conclusion

It is self-evident that standards form a very important part in the machinery of civilization, but it is only after a period of countless centuries of spontaneous and undirected growth of standards that the civilized world is finally beginning to standardize on the production of standards. Much benefit has already been obtained from this effort and much can be expected.

Courtesy Midshipman C. H. Parks, U. S. Navy

AT SEA WITH THE MIDSHIPMEN'S PRACTICE SQUADRON

Courtesy Midshipman G. M. Holley, U. S. Navy

THE BARCELONA EXPOSITION AT NIGHT

Courtesy Midshipman G. M. Holley, U. S. Navy

THE BARCELONA EXPOSITION AT NIGHT

Courtesy Midshipman G. M. Holley, U. S. Navy

ANOTHER VIEW OF THE COLOSSEUM

UNIV. OF MICH.

Courtesy Midshipman C. H. Parks, U. S. Navy

THE KING'S GUARD, LONDON

Courtesy Midshipman C. H. Parks, U. S. Navy

MIDDLE TOWER, TOWER OF LONDON

UNIV. OF MICH.

Courtesy Midshipman G. M. Holley, U. S. Navy

AND THIS IS LONDON!

Many midshipmen visited London on the cruise of 1929. Above is the entrance to Hampton Court Palace.

Many midshipmen visited London on the cruise of 1929. Above is the entrance to Hampton Court Palace.

Courtesy Midshipman G. M. Holley, U. S. Navy

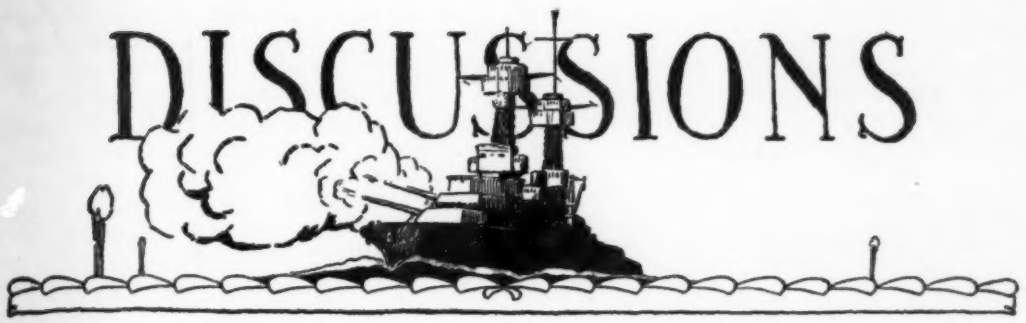
GARDENS IN REAR OF HAMPTON COURT PALACE

UNIV. OF MICH.

H.M.S. *EAGLE*

A photograph taken from ships of the practice squadron of 1929.

Courtesy Midshipman C. H. Parks, U. S. Navy



The Speed of Battleships

(See PROCEEDINGS for April, 1929, p. 273; August, 1929, pp. 714 and 730; October, 1929, p. 893; November, 1929, p. 977).

LIEUTENANT FRANKLIN G. PERCIVAL, *U. S. Navy (Retired).*—Critics of this paper devote considerable space to proving that historically one power has been able to get more out of a given displacement than has some other power. However, it by no means follows that the U. S. Navy will so far outstrip all its rivals as to obtain, in its next battleships, superior speed as well as superior gun power and protection. These critics forget that, in discussing the proper characteristics for future construction, we *must* assume that the skill and morale of the designing and operating personnel of the various navies are equal. Otherwise, we introduce so many variables and imponderables that no intelligent discussion is possible. If we accept this premise, it follows that, on a fixed maximum displacement, we cannot have superior striking and resisting power in the same hull with superior speed. Most of the arguments for faster battleships thereby collapse. It is perhaps unnecessary to add that, for the same reasons, we must assume equality in numbers in all hypothetical cases.

Much difference of opinion arises over the value of the six advantages formerly claimed for speed. Accordingly we will discuss in turn the objections raised under each of these six headings.

STRATEGIC VALUE

Objectors stress the strategic value of speed for short distances when the limited fuel capacity of destroyers would not enter into the situation, but they ignore the changes wrought by the introduction of strong air forces. One change is that the potentiality of aircraft for concentrating on outlying units will usually demand that the entire fleet be assembled before entering the area of probable operations. Another change is that aërial scouts will usually detect hostile forces at such a distance that one will seldom need superior speed for delaying or avoiding action. Since low visibility is practically the only condition which precludes flying, and since the outcome of any battle fought in low visibility is so largely a matter of chance that few will care to engage, may we not say that aircraft have annulled the strategic value of speed for short distances?

Lieutenant Commander Reeves discusses probable improvements in the fuel endurance of future destroyers which will permit higher long-distance strategic speeds for fleets of the next decade; but he does not demonstrate that this will more than offset the greater distances to be considered in the Atlantic and Pacific as contrasted with those of the North Sea. That the submarine menace will usually demand that destroyers patrol at a speed 20 per cent greater than that of the rest of the fleet must not be forgotten.

This same critic writes: "Even with great distances the value of time may outweigh the disadvantages of large fuel expenditures." Would not the large fuel expenditures necessitate the inclusion of fuel ships whose limited speed would reduce that of the fleet? Even if it should be practicable to carry enough fuel on the larger fighting ships to refuel the destroyers, much time would be lost by the necessity for slowing down during that operation. The menace

from submarines would also be increased, due to the necessity for steaming on straight courses at low speed while refueling.

Sir Herbert Russell offers the following argument:

> Had two United States battleships left Devonport for the Falklands to try and head off von Spee's squadron, they would have arrived after he had done the mischief he designed and vanished. Sir Doveton Sturdee, with his three knots superiority over any American capital ship, was able to be there waiting for his enemy.

This British journalist seems to have confused strategic speed with tactical speed, and to have assumed that Admiral Sturdee made 25 knots all the way down to the Falklands. Such was far from being the case, for he required twenty-six days to get from Devonport to Port Stanley. There is probably not a battleship in our fleet which could not have improved on this performance. As it happened, they would also have had enough speed to have overtaken von Spee after they got there. Although, in some future case, they might not have enough speed, we now have aircraft carriers, whose planes constitute the necessary high-speed striking force for dealing with such vessels.

Long before the advent of aircraft, Mahan was not in favor of sacrificing armament and protection to gain speed. If aircraft have annulled the strategic value of speed for short distances and the limited fuel capacity of destroyers prevents a high fleet speed for long distances, how much less would Mahan favor that sacrifice today!

Ability to Force or Refuse Action

Criticisms under this head again ignore the effect of the aërial scout which usually insures contact at such distances as to make a few knots difference in speed of negligible value for either pursuit or escape. They ignore, furthermore, the point that, even if we eliminate the aërial scout, superior speed to overtake an enemy is useless unless accompanied by either superior numbers or superior striking and resisting power. The advantage of numbers is as likely to be against us as for us, while the latter combination of all-around superiority is impossible on a fixed maximum displacement.

Objectors also forget that the Grand Fleet was unable to bring the High Sea Fleet to decisive action during four long years of war in spite of a marked preponderance in numbers, gun power, and speed —all the traditional elements of offensive strength. The way in which both Scheer and Tirpitz stated that such an action could have been forced called not for superior speed but for those qualities which can be obtained only by sacrificing speed. These same qualities also are those generally conceded to be needed for fighting a willing fleet of equal strength. If they at the same time suffice for bringing to action an unwilling and weaker fleet, the supposed advantages of speed in this connection disappear.

Ability to Choose Range

The whole discussion boils down to this: under the Washington treaty which limits the caliber of guns that may be carried by battleships, there is little likelihood that one ship will outrange another, or that visibility conditions would permit the faster ship to take advantage of superiority in range, even if it possessed such superiority. Furthermore, since the faster ship must inevitably be more scantily protected, it follows that such a vessel must pass through a zone in which it may receive vital damage before arriving within the zone in which it can inflict vital damage. The advantage of prior damage is too well understood to require amplification. Just what benefit then, may be reaped by the vessel possessing higher speed?

Ability to Choose or Alter Bearing

Lieutenant Commander Reeves writes:

> That the increase in the factors which determine this (favorable) bearing complicates matters is true. But there is no more probability that twenty factors will cancel each other than that two will do so.

This critic fails to note that distinct advantages were pointed out as the result of having the wind on any one of three widely divergent bearings; on the engaged bow, on the unengaged bow, and dead astern. By no possible combination of circumstances can these advantages be made to coincide on a single bearing. Do not their respective advantages then, inevitably tend to cancel one another? Even if some certain bearing has marked advantages, it by no means follows, due to the many almost insurmountable haz-

ards, that the faster fleet will attain the desired bearing.

Tactical Concentrations

In his discussion under this head, Lieutenant Commander Reeves forgets that the initial blunder which resulted in the loss of the *Blücher* was her inclusion in a squadron which expected to fight a retiring engagement against superior forces. The argument here is for homogeneousness in any squadron. The lack of homogeneousness, however, was not nearly so great as stated by this critic. Standard works of reference give the speed of the *Blücher* as 25.5 knots, instead of the 22.5 knots given by Lieutenant Commander Reeves. Nevertheless, if she was included, why should she have been thrown to the wolves? If the pursuit had been properly handled, the sacrifice of the *Blücher* would not have insured the escape of the others.

Lieutenant Commander Reeves then objects:

> As to Jellicoe's two concentrations at Jutland, it is difficult to understand how a force that was never seriously engaged can be said to have made a concentration on anything.

Would not Scheer's complete reversal of course on two occasions indicate that he found himself in a very unfavorable position? The fact that the concentration was not maintained long enough in either case to produce decisive results does not disprove the effecting of a concentration.

Lieutenant Commander Reeves next writes:

> Relative to greater ease of withdrawal from an unfavorable situation, what is probably meant is that, with modern developments, leading an enemy into an unfavorable situation becomes more difficult. However, whether it is a question of ease of withdrawing from, or difficulty of leading into, an unfavorable situation, the importance of speed —to the offensive—has been increased rather than decreased.

It had already been pointed out that Scheer would not have walked into either of these holes if he had had adequate aërial observation. The modern developments referred to which permit greater ease of withdrawal from an unfavorable situation are: increased use of smoke screens, employment of mine layers, torpedo planes, fleet submarines, motor torpedo boats and more effective destroyers; all of which would make it extremely hazardous for a fleet to attempt a direct pursuit after a turn-away. If the direct pursuit can be rendered impracticable, the concentration is lost. In subsequent maneuvers, speed will, of course, be of value; but, generally speaking, only if it be accompanied by superior gun power or protection.

The tactical concentration referred to by Lieutenant Commander Luckel is possible only if we assume that the slower fleet is incapable of maneuvering to avoid the threatened concentration.

Ability to Overtake Beaten Fleet

Lieutenant Commander Reeves believes that:

> In the event of a serious war it is unquestionable that a large building program would be immediately put in hand, and that the characteristics of the new ships would be quite different from those so confidently counted on in the essay.

In every modern naval war, a decision has been reached at sea by the vessels which were either completed or under construction at the time the war broke out. Even with vessels that can be built as rapidly as destroyers, the reader will recall that the submarine crisis had been passed before any of our special war-time construction was completed. Does Lieutenant Commander Reeves recommend that, after war is declared, we sit quietly by until a new fleet has been built before commencing active operations? In this connection, it is well to remember that other powers also can build new ships. Even if the Washington treaty is abrogated and such vessels are built in time to exercise an influence, is it not likely that the limiting factor would be displacement? If so, we would then be up against the same problem of getting the maximum fighting power on the given tonnage and the same excellent reasons for moderate speed would probably be found to hold.

Miscellaneous

Lieutenant Commander Reeves objects that:

> The events of the World War, taken alone, are not good evidence on the subject of the speed of battleships for the simple reason that during the war there was but one meeting between vessels of the battleship class. And that one meeting is not mentioned in the essay. . . . . The argument of the essay contains much that has to do with other types of ships but little that bears directly upon the subject of battleships.

This critic fails to state what available evidence he does consider to be satisfactory. The Battle of Jutland is mentioned several times in the essay. The failure to discuss the encounters between battleships was intentional. Those encounters were of such a nature due to freakish visibility, to unequal numbers, and to brief engagements that no conclusions could be drawn from them. It is noteworthy that when Lieutenant Commander Reeves wished to make his point about superior fighting power, he was obliged to refer to the battle cruiser action. Why, then, the criticism for discussing the engagements between those other classes of armored vessels which did fight under conditions which permitted conclusions to be drawn?

This same critic does not think that the British views as to the relative importance of speed and protection underwent any change as a result of their experience at Jutland. He forgets that the *Hood* was given an armor belt precisely *double* the thickness of that of her immediate predecessors and that, after the war, these predecessors were blistered and rearmored, adding approximately 5,500 tons to their displacements. It apparently means nothing to him that the speed of the *Nelson* and *Rodney* was only 23 knots, when the speed of their latest battle cruisers indicated that they expected to adopt a speed of 25 knots for future battleships. It is quite possible that the *Nelson* and *Rodney* would have been even slower if it had not been necessary to consider homogeneousness with existing vessels. This same necessity was probably the reason for the 32-knot speed of the projected battle cruisers. When we recommence the building of battleships, however, we shall replace the lot in a few years and can better afford to ignore existing speeds. Finally, the fact that the British have built the slowest and most stoutly protected treaty cruisers yet constructed apparently is of no significance to this critic.

Lieutenant Commander Reeves, furthermore, does not believe that the views of Admiral Jellicoe underwent any change as a result of his war experience. He ignores the unmistakable evidence of the "before and after" quotations in the original paper, and the fact that, during Jellicoe's pre-war stay at the Admiralty, the speeds of all types of ships were increased by from four to eight knots. Someone must have been very enthusiastic about speed in those days. As to Jellicoe's post-war views, our critic admits that the admiral would never sacrifice armor or armament to gain speed. Since that is the only way that speed can be gained under the Washington treaty, there is nothing more to be said.

Lieutenant Commander Reeves next writes:

> The essay produces considerable argument to prove that the armor protection of British battleships at Jutland was deficient. Most of the argument is irrelevant in that it relates to battle cruisers, or in fact to any other type than the one under discussion.

He then supplies the deficiency by two tables showing damage received by opposing battleships. He admits in both cases that "varying conclusions may be drawn," and attempts to draw none himself. What, then, is the purpose of the tables and why should one be criticized for not having included them in a paper already overcrowded with material from which definite conclusions could be drawn?

This enthusiastic proponent of high speed also devotes considerable space to the many technical improvements which enable weight to be saved. Even if they are so remarkable as to permit the necessary additions to defensive armament, ammunition allowances, and protection, while providing for a substantial increase in speed; it is our contention that it would still be better to cut the speed and use the weight saved to strengthen the main battery. The battleship exists primarily for the transportation, service, and protection of the big guns; its value is in direct proportion to the number of them which it carries, after first providing sufficient armor and defensive armament to give us reasonable assurance that those powerful weapons will be kept afloat and operating in the battle line. Mahan, in discussing speed, says: "It is in the battleship secondary to gun power."

Lieutenant Commander Reeves concludes with the following sentences:

> Should we reduce the speed of our new battleships—if any—to 15 knots, we thereby immediately reduce the speed of our entire fleet to that figure. We endow our commanders with an initial handicap, strategic and tactical, and renounce definitely the principles and opportunities of the offensive. It seems rather a high price to pay.

Mahan would certainly not agree with

this assertion. It rests upon the dubious premise that our next battleships could have superior speed as well as superior striking or resisting power. The experience of the British battle cruisers at Jutland indicates that nothing so utterly unfits a vessel for the tactical offensive as high speed with the inevitable deficiency in protection. History also seems to indicate that the Grand Fleet was unfitted for the strategic offensive.

Lieutenant Commander Luckel asks:

> Would not the slower battleships also be subject to a greater torpedo menace due to enemy torpedo craft being able to reach a more advantageous firing position as well as the slower ships being handicapped by their low speed should they have to maneuver to avoid being struck?

Although, at Jutland, destroyers had some difficulty in getting into position for attacks or counterattacks, was not this due to their faulty tactical disposition before fire was opened, rather than to their lack of speed relative to the battleships? The latter were making only 14 knots during the critical period. When it comes to dodging torpedoes, the smaller turning circle of, and the smaller target afforded by, the slower ship would be a decided advantage—to say nothing of the fact that it could also have better underwater protection.

Captain Procter calls attention to certain errors made in estimating the probable saving in machinery weight, due to cutting the speed of a 35,000-ton battleship from 23 to 19 knots. His figures, of course, must be accepted as authoritative. Although the errors made are keenly regretted, they do not invalidate the argument for a reduction in speed for two reasons. One is that the overestimate of the saving in machinery weight is probably more than offset by the underestimate of the other savings in weight. The other is that there are several advantages besides the total tonnage liberated for other purposes.

What are the other savings in weight which result from a reduction in speed, and which Captain Procter completely ignores? To begin with, a marked cut in speed allows us to have a shorter hull of greater beam. Not only will the hull itself weigh less, but also it can be given equivalent protection on a smaller weight of armor. Another point is that if we adhere to the present system of electric propulsion, a speed of 21 knots or better would probably necessitate the retention of two heavily armored uptakes; whereas a speed of 17 knots would so reduce the necessary horsepower that all boilers could be grouped under one uptake, —a very substantial saving in weight. Regardless of what type of machinery is adopted, a cut in speed would reduce either the size or the number of openings which must be made in the protective deck. Although these openings can be partially protected by armor gratings, each of them constitutes a potential source of disaster in battle. A marked reduction in their number or size is therefore a very definite contribution to the fighting efficiency of the ship. The other advantages were summed up in the concluding section of the original paper.

To come down to definite figures, nothing is so illuminating as a comparison of two ships that actually have been built. The *Revenge* and *Queen Elizabeth* are interesting examples, for they are approximately contemporary and were produced by the same designers, while both have the same main battery, the same thickness of vertical armor, and the same type of propulsive machinery. The *Queen Elizabeth*, however, has two knots more speed, a protective deck thinner by one inch, and two fewer 6-inch guns. Yet, in spite of these deficiencies, the *Queen Elizabeth* had to be given 1,750 tons additional displacement to attain the extra *two* knots. If we bear this in mind, is it not apparent that our estimate of a probable total saving in weight of 2,000 tons resulting from a *four*-knot cut was fairly conservative, even after making deductions for considerable improvement in propulsive machinery in the past seventeen years? This is not offered in a spirit of bickering, but simply to show that in two actual ships of otherwise similar characteristics, a very substantial price has been paid for a two-knot superiority in speed.

Captain Procter also writes of the enormous saving in weight resulting from the reduction in speed of fast cruisers, but he apparently forgets that the speed of all other types is based wholly or partially upon that of the battleships. Slower battleships, therefore, mean more robust qualities for the entire fleet.

PROFESSIONAL NOTES

April 2 to May 1

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Lieutenant Commander D. C. Ramsay, U. S. Navy
and
Professor Henry Bluestone, U. S. Naval Academy

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GREAT BRITAIN

H.M.S. "Acheron"

The Engineer, March 21.—On Tuesday, March 18, there was launched from the Woolston yard of John I. Thornycroft and Co., Ltd., a British destroyer, *Acheron,* which in some respects marks an important development in the construction of naval vessels. The feature of interest in her design is the fact that she is the first war vessel to be fitted for the use of high-pressure superheated steam, combined with air preheaters. Her machinery consists of Parsons turbines driving twin screws through reduction gearing, and supplied with steam from three Thornycroft boilers. According to Sir Charles Parsons, her consumption of fuel oil should be about one-half pound per horsepower hour, or almost the same as that of a heavy oil engine of equivalent output. Sir Charles has also stated that with this consumption she should be from 10 to 15 per cent more economical than her sisterships fitted with turbines using half her boiler pressure. The *Acheron* is the 101st British destroyer built by Messrs. Thornycroft. She belongs to the 1927-28 program. Her length is 312 feet between perpendiculars, and her designed displacement about 1330 tons. It is anticipated that her speed will be about 35 knots. Her armament consists of four 4.7-inch guns, two 2-pounder pom-poms, five machine guns, and eight 21-inch torpedo tubes. The fuel oil capacity is 380 tons.

Airships versus Cruisers

Naval and Military Record, April 9.—It has been suggested that in their willingness to acquiesce in the reduction of our cruiser strength to fifty vessels, instead of the seventy which they formerly mentioned as representing our needs, the Admiralty have shown a foresight with which they are not credited. We are asked to consider the possibility that, in their view, the airship may so usefully supplement the cruiser as to be able to perform many of her functions. Three airships can be built for the cost of one medium cruiser, and therefore this presumptive foresight, instead of being one of unreasoning surrender to pacifism, is sound economy. We must confess to the conviction that the Admiralty would be emphatic in disavowing this apologia were they under the necessity of speaking upon the subject. Theoretically, the airship should be able to do the work of a scouting cruiser. But in practice she is too unreliable. Time may bring a standard of perfection which, at present, seems not merely improbable but impossible. The Admiralty really cannot afford to wait upon such a remote contingency in calculating their requirements to ensure security.

It is universally admitted these days that the primary metier of the cruiser is to defend sea communications. As a fleet scout the seaplane has taken her place. Of what value would the airship prove in trade defense? She must be prepared to attack any enemy warship which is seeking to molest trade. Her extreme vulnerability puts her to hopeless disadvantage. For bombing warfare her evolutionary unwieldiness would render her little more than an object of derision by any vessel she sought to menace. She might carry a few small bombing aeroplanes, and use these to attack enemy ships, but the odds are that they would have no home to return to if she succeeded in getting them away, and, in any case, she would be a miserable substitute for an aircraft cruiser. The Navy is virtually unanimous that the airship is of no use to it, whilst the Army, of course, made up its mind on this subject long ago. There is no military service she could perform which the aeroplane could not undertake very much more effectively. The idea that twenty airships would compensate for the loss of twenty cruisers is merely fantastical.

New Destroyers' Sea Trials

London *Times,* April 2.—Several of the eight destroyers of the *Acasta* class have completed their sea trials. The design of the machinery in these ships is identical, and the results obtained are so uniform that those recorded on H.M.S. *Arrow,* built by Messrs. Vickers-Armstrongs at Barrow, may be taken as representative.

The speed obtained at the designed displacement was 36.7 knots, with a s.hp. of 34,119. No attempt was made to exceed the designed s.hp. of 34,000, as the Admiralty trials are required to represent service conditions, and forcing is not permitted. The weight of the machinery is 465 tons, and in considering the figures given it should be borne in mind that the speed and power

given are those which were maintained over a 6-hour trial, and which could be maintained for a time which is limited only by the bunker capacity. The fuel oil consumption obtained was the low figure of .81 lb. of oil per s.hp. per hour.

Spectacular figures for speed and power have been quoted from time to time as having been attained on the Continent, but when endurance is taken into account the figures given above are exceptional.

Our Big Submarines

Naval and Military Record, April 16.—Since our recent comments upon submarine cruisers, apropos of the craft of this type which France and the United States are passing into commission, has come the news that *X-1* is to be withdrawn from the Mediterranean and paid off into reserve at Chatham. Whilst this may only mean that the vessel is due for a bigger refit than Malta Dockyard is prepared to undertake, the general opinion seems to be that *X-1* will not rejoin the First Submarine Flotilla, and it it is also rumored that *K-26*, the next biggest British submarine, will shortly be detached from that flotilla and brought home. The *X-1* has always been regarded as an independent unit, and the *K-26* is too big for fleet flotilla work; therefore both craft have been under the orders of the Captain (S.) for administrative reasons only. The remainder of the First Flotilla is composed of submarines of the L-class, boats of rather less than half the displacement of the X- and K-types.

It is pretty evident that the Admiralty are not much impressed by the merits of the submarine cruiser. They have not attempted to put her to the one use to which she is best suited, and for which foreign powers employ her, namely, as a submarine mine layer. *K-26* is the survivor of a batch specially constructed to cope with the U-boat campaign and steam driven, so as to get a higher surface speed than the stage of motor development at that time would have yielded. *X-1* has always been rather mysteriously referred to as an experimental boat. Her performances have been quite satisfactory, but she is a bit of a white elephant. A squadron of such craft would form a formidable threat to an ocean trade route, but considerably smaller submarines are quite formidable enough in this way, and mere size is a distinct disadvantage to the underwater boat. Still, it is as well that *X-1* should have been built, since her existence has enabled the Admiralty to crystallize their views upon the rather nebulous ideas she represents. As a matter of fact, the proposal raised at the naval conference to restrict the size of the submarine so as to limit her capacity for mischief is sheer eyewash. The bigger the submarine the less mischief she is likely to do, because concealment becomes increasingly difficult and evolutionary mobility is heavily sacrificed (particularly in diving) in relation to growth.

Technical Progress

The Shipbuilder, April, 1930.—Catapults for the launching of aircraft from ships are now installed in several vessels, including the *Resolution* and *Frobisher*, but finality in design has not yet been reached. Several types are being exhaustively tested and experimental work is being pursued, active liaison being maintained with the Air Ministry. The trials are being carried out from the *Ark Royal*.

Considerable progress has been made in modernizing the antiaircraft defence of the fleet and in installing a new system of fire control for the antiaircraft guns.

Improved fuel economy and reliability continue to be sought after in all new machinery designs. Increasing use is being made of electrically-driven auxiliary machinery, with the object of securing improvement in economy when working at reduced powers. Useful work, which should prove the means of further improving fuel consumption afloat, besides improving operation and reducing wear and tear of furnace fittings, has been carried out during the past year at the Haslar Liquid-fuel Experiment Works.

At the Admiralty Engineering Laboratory the development of heavy-oil engines for naval purposes has proceeded steadily. The design and construction of an advanced experimental type of high-speed Diesel engine, in which an attempt is being made to reduce the machinery weight considerably in comparison with existing practice, are also in progress there. In addition, data required for existing designs have been determined experimentally as required, and

metallurgical investigations have been carried out to meet the requirements of the Service.

Trials of oil obtained from the low-temperature carbonization of coal have been carried out at the Liquid-fuel Experiment Works at Haslar and in a destroyer, and arrangements are being made to obtain supplies of similar oils from the principal firms in this country with a view to carrying out further trials.

Progress in the development of the use of pulverized fuel is being closely watched.

Trials have also been continued at Haslar and elsewhere with plants for eliminating the oil fuel from the water in the mixtures arising from fuel-tank washings and other contaminated supplies. Improvements in these processes have been made, and several plants are now available for service.

Trials have been carried out ashore and afloat with various new materials and corrosion-resisting processes.

The development of light alloys in replacement of heavier materials is another matter which is being closely followed, and various investigations and trials are in progress.

In conjunction with British electric-cable manufacturers, a comprehensive research and investigation into the various types of electric cables have been undertaken, resulting in the production of cables of greater durability, which should ultimately effect considerable economy in maintenance.

Several experiments have been carried out with a submarine-escape apparatus, which offers a greatly improved means of individual escape to the crew of a sunken submarine, and the provision of this apparatus to each officer and man in submarines is in progress. Other experiments have been made, and are continuing, with the object of improving measures of submarine salvage in case of necessity, an important feature being that means have been found to enable divers to reach much greater depths than had previously been considered practicable.

English Naval Bases Urged for U. S. Use

Washington *Daily News*, April 9.—Great Britain should permit the American Navy to use every British naval base, J. L. Garvin, editor of *The Sunday Observer*, said at a luncheon of the American Chamber of Commerce. His remarks caused a sensation among hundreds of American business men at the luncheon, which was in honor of Garvin.

"Great Britain and America are not rivals on the sea, but joint guardians," Garvin said. He added his conviction that Britain should remain neutral in any future war as long as America was neutral.

Garvin is editor in chief of the *Encyclopedia Britannica* and one of England's foremost advocates of Anglo-American friendship.

FRANCE

Auxiliary Cruisers

Naval and Military Record, April 16, by J. B. Gautreau.—Under the new conditions of war, fast liners are potential auxiliary cruisers. Their number, speed, and size are military assets of value. The seaplanes with which they can be provided add to their radius and will render their capture rather difficult. Likely preys and enemies to be avoided they will detect within 100 miles. The range of 6- and 5-inch guns designed to arm them will give them a fair chance of having an effective say in cruiser actions, and this was not the case in the last war. The twelve large Italian liners of over 20,000 tons displacement and 20 knots speed in service or building mean an increment of Italian sea power, all the more so as naval reservists are serving on board. Italy before the war had not a single liner of over 10,000 register tons, whereas at present she greatly excels France. The latter, however, is making an effort to regain her former position, and St. Nazaire, the only yard in France capable of building very large ships, is very busy. The motor liner *Lafayette*, of 22,000 gross tons, similar to the British *Alcantara* and *Asturias*, has just been delivered to the Compagnie Transatlantique, whilst the Penhoet Chantier has just floated the *Atlantique*, of 39,000 gross tons and 24 knots, of 60,000 hp., which is a French counterpart to the English *Empress of Britain*. The *Atlantique* will be the largest and finest unit on the South American route. A *Lafayette* No. 2, of 23,000 tons and 22 knots, with turbines and electric drive, has been ordered. The super *Ile de France*, of 61,000 tons and 29 knots, will only be laid down by the end of the present year, on the 330-metre-long slip now being completed at St. Nazaire.

The *raison d'être* of cruisers is to fight, that is, to have as many guns as possible of the highest power and range, together with sufficient armor and defensive devices to give the armament some chance of displaying its worth. Luck is a poor defence, though it costs nothing. The reproach against the fine *croiseurs legers* now in service is that luck is their main, if not their only, defence against enemy shells. On the other hand, they are upstanding, roomy, comfortable vessels to live in, with many bathrooms and all hygienic conveniences, besides being well ventilated and relatively cool in their engine-rooms, and for that reason especially suited for ocean cruisers in liner fashion. Officers de vaisseau of the old pugnacious, sea-dog school condemn this systematic research after comfort and up-to-dateness in living installations. *Le mieux est l'ennemi du bien.* They condemn the ideas responsible for the designing of the *Jeanne d'Arc,* cadet ship, now completing at St. Nazaire, which combines the characteristics of a warship and those of a passenger ship. Young Messieurs, brought up in that paquebot-croseur, it is contended, will contract habits of comfort hardly compatible with the requirements of the sea service. They will feel pinched on board submarines and destroyers and will sigh for more breathing space. War cannot be waged on de luxe principles; it is a rough game. Budding officers must be prepared to rough it and be taught early the supremacy of fighting efficiency over all other considerations.

French ingenieurs, previously foremost for the military utilization of displacement, are lagging behind the Germans and the Italians. Battle cruisers of the *Ersatz Preussen* type, which will increase in number as soon as the London disarmament conference has breathed its last, will within the next five years bring Germany anew to the forefront of Continental navies. Six long-range 11-in. guns, under thick armor and on steady platforms with 7-in. belts, represent a deadly menace to tin-clad cruisers of the Washington standard which would have little chance to withstand, within striking distance, a single German salvo. The most progressive among French experts are today unanimous in considering *croiseurs legers* of the *Hawkins, Enterprise, Duguay-Trouin,* and *Principe Alfonso* classes to have been a blunder from a fighting standpoint and a waste of money, displacement, and opportunities. German ingenieurs have taught the world a lesson, and costly enough; they hate make-believe, conventional work, and are guided solely by the image of the real thing: *der Tag* is ever in their mind. *Esprit de suite* characterizes their work from 1914 to this day. The ex-German 5,000-ton cruisers *Metz, Mulhouse,* and *Strassburg,* still in commission or in reserve in the French Navy, although their workmanship leaves much to desire, combine good armor protection with an armanent nearly equal to that of our *Duguay-Trouins,* which are larger by 3,000 tons. Acting on the same principles, German ingenieurs have given their *Königsberg* and *Kölns,* nominally of 6,000 tons, defensive qualities superior to those to be found in French and English 10,000-ton cruisers.

The last war revealed the fact that Germans had been hiding their game in the matter of warship design. Their ships turned out to be more powerful and also faster than they were thought to be. They are today working on the same lines; their 32-knot *Leipzigs* are credited by competent observers here with being good for 35-36 knots at maximum speed, and their 26-knot *Ersatz Preussens* have every chance, from their motor power, length, and hull shape, to reach 30 knots with some 60,000 hp. (which their motors will easily produce). German designers have not, as the French have done, sacrificed much to appearances and *poudre aux yeux.* Two or three knots extra speed above 30 knots for fighting cruisers cost more than they are worth. The *Colbert, Suffren,* and *Tourvilles,* which do about 30 knots and 60,000 hp., require some 105,000 hp. to exceed 32 knots. A superiority of two or three knots in speed in these days of long-range salvos is not worth a sacrifice in defensive qualities; and displacements of 10,000 tons are very much too large nowadays for vessels meant for speed, with the result that the *Foch* and *Dupleix,* in hand at Brest, will be the last French cruisers of the Washington type. The *Foch* will be ready by the end of 1930, and the *Dupleix* will be launched in September next, ten months after the laying down of the keel. Valuable improvements, though, have been made by the Paris Section Technique in the offensive and defensive qualities of these cruisers which will have a

striking appearance, differing from the silhouette of their sister-ships now in service, their masts notably being unseemly large, lofty, and heavy—all for the sake of detecting and accurately locating first their eventual antagonists and smashing them out of existence under well-directed volleys. These masts are the expression of a belief in range superiority.

Admiral Descottes-Genon, the commander of the recently-formed fast cruiser squadron, comprising the *Duquesne* (35.3 knots), *Suffren* (33.7 knots), *Colbert* (33.9 knots), and *Tourville* (36.2 knots), is a gunnery expert of repute, having obtained the best results as a captain. Gunnery will have his every care. From tests at the Gavres ballistic station the French 8-in. ordnance steadily improved as the result of ceaseless experiments, possesses accuracy at long range, and long-service gunners, obtain a growing rate of fire. Quick firers of 90 mil. have been substituted for the 75-mil. type in the *Colbert* and *Foch*, and it is possible that the *Duplex* is fitted with 100-mil. weapons, suited both for anti-torpedo and anti-aerial work. Excellence in gunnery will be the main object of Admiral Descottes-Genon.

If criticisms are freely leveled at cruisers and even at destroyer designs, the new type of submarines, on the other hand, comes in for unanimous commendation on the part of specialists. The nine units of 1,200 tons of the *Requin* class are good fleet submarines, having given satisfaction at sea and for their size are the most powerfully-armed in service. Their enlarged and improved copies of the *Redoubtable* type are declared to be perfect for ocean work and probably form the strongest submarine force in service or building. They mount eleven tubes of 22-in. bore, containing 1,800 kilo torpedoes, with two torpedoes in reserve. Their Diesel motors, nominally of 6,000 hp., are good for 7,000 hp. In the newest units with the same total weight and space 8,000 hp. is expected. The surface speed of 18 knots on paper easily attains 20 knots. The *Monge* has done 20.6 knots off Toulon. Normally the boats ordered last year ought to do 21.5 if not 22 knots. Conditions of habitability are described as very satisfactory, enabling the radius of action of nearly 13,000 miles to be eventually utilized to the full for colonial defence.

Submarine training and cruising is briskly going on. Since the *Ondine* disaster submarines are cruising in pairs. The 600-ton *Doris* and *Circe* have accomplished a Mediterranean tour. The 1,560-ton *Redoubtable* and *Venguer* are showing the flag in the Atlantic and displaying remarkable sea qualities.

The French Naval Policy

The Engineer, April 4.—The ideas of France with regard to naval policy appear to have been summed up in the debate on the naval credits in the Senate. Little importance was attached to the German efforts to combine the maximum armament and speed within the 10,000-ton limit on the ground that Germany is not in a position at the moment to continue the construction of such costly ships, while, in any event, the danger from them, according to the French, is minimized by the submarine. Nevertheless, it was declared that France has prepared the plans of a new type of ship that may counter the German battle cruiser, but that nothing will be done with it until the result of the London conference is known. All other considerations of strategy are subordinated to the necessity for keeping the route open between France and the North African Colonies. This consideration is the basis of French naval policy which makes an acceptance of parity with Italy impossible, and the increase of the Italian program of naval construction is regarded as eliminating all chance of France's reducing her own. What the French particularly regard as disquieting is the character of the new Italian Navy, consisting as it does mainly of light and rapid cruisers and destroyers, and a strong air force that can obviously have no effective range beyond the Mediterranean. In the opinion of the French, the security of the African Colonies cannot be ensured by parity with Italy. Still, there is a limit beyond which some continental countries will find it difficult to go in the way of naval construction. France needs a minimum effective personnel of 53,000 men, and it is not easy to find it, despite the special advantages offered.

Armed Merchantmen and Submarines

The Engineer, April 18.—Naval experts in France are puzzled to know what to do with the proposed restrictions on subma-

rines. Although big submarines lack handiness and are too conspicuous to fulfill all the requirements demanded of underwater craft, they are, nevertheless, regarded as essential to a country possessing few naval bases, and the idea of limiting the number of vessels of the *Surcouf* class to three does not meet with French approval. Objection is even stronger to the arming of the smaller submarines with guns of a maximum caliber of 5 in. This restriction, it is claimed, will place the submarine at the mercy of fast liners, which, with their superior armament and speed, could compel the underwater vessel to submerge and disappear. While Great Britain possesses 208 ships of from 6,000 to 30,000 tons capable of steaming at 15 knots at least and 8 liners of greater tonnage that can steam at 20 knots or over, France has only 2 ships of the latter class. Her inferiority in this respect is manifest when compared not only with Great Britain, but also with Italy. By arming her merchantmen Great Britain, it is said, escapes the consequences of parity and the reduction of her Navy. The French declare that they cannot accept the proposed compromise. The discussion tends to show that a reduction of naval armanents may be followed by further competition in the building of big and fast merchantmen that will become formidable auxiliaries in time of war.

SPAIN

Trials of the "Miguel de Cervantes"

Le Yacht, March 15.—The 8,000-ton cruiser *Miguel de Cervantes,* laid down in 1926, has completed her official trials. The highest speed attained was 35.2 knots, corresponding to 347 revolutions per minute, with 81,130 hp. The endurance test which lasted 48 hours was made with 60,000 hp. for the first 12 hours, and 40,000 for the rest of the time. The cruising radius at a speed of 15 knots, calculated on the basis of the results of a (fuel) consumption test of 24 hours, is 5,000 miles.

Delayed Construction

Le Yacht, April 12.—For economic reasons, the Spanish government has stopped the construction of two 1,000-ton cruisers, *Baleares* and *Canarias,* begun in execution of the act of July 4, 1926, at the Ferrol yards. They were to be finished in 1932. Their completion is now scheduled only for 1935.

This measure is the consequence of the incorporation of the extraordinary naval construction budget, the appropriations of which amounted to 100 million pesetas, in the ordinary budget which provides for this purpose only an expenditure of only 61 million.

"Alcala Galiano" Launched

Le Yacht, April, 12.—The Cartagena yards launched the destroyer *Alcala Galiano* of 1,650 tons, intended to replace the ship of the same name sold to the Argentine Republic in 1927, and the submarines *C-5* and *C-6* of 915 tons on surface and 1,290 submerged; length, 75 meters; speed, 16 knots; armament, six torpedo tubes of 533 mm. and an antiair gun of 75. mm.

ITALY

To Lay Down 29 Fighting Ships

New York *Times,* May 1.—The Italian government decided today to lay down 29 new warships this year—a total of 42,900 tons divided into a 10,000-ton cruiser, 2 5,100-ton scout cruisers, 4 1,240-ton destroyers, and 22 submarines totaling 17,740 tons.

Four of the submarines will be of 1,390 tons each, 6 of 810 tons, and 12 of 610 tons.

The Council of Ministers decided on the program after a detailed report by Admiral Sirianni, who was the Italian naval expert at the London naval conference. The afternoon press hails the action as bringing "parity in fact."

Giornale d'Italia points out that the program confirms Italy's policy of concentrating her armaments in small units which obviously are defensive units, while "national technical intelligence can assure their particular efficiency, even when contrasted with the largest foreign units."

Lavoro Facista remarks that the new construction constitutes the best proof that, far from wishing to engage in an armaments race, "Italy knows how to conserve and make prevail on the sea her incontrovertible right as a great power."

Launchings and New Construction

Le Yacht, March 15.—The flotilla leader *Nicoloso da Recco* was launched in January at Ancona, and the *Antonio Pigafella* shortly afterward at Fiume.

These two 2,000-ton ships will be armed with six guns of 120 mm. (4.8 in.), and six torpedo tubes. Their speed is to be 38 knots. According to the original plans, the entire division was to enter service in the near future; but there will no doubt be some delay.

The submarine *Tito Speri* has been subjected to long plunging trials in the course of which it remained one hour at a depth of 105 meters (about 350 ft.).

In addition to the extraordinarily important orders they are executing for the Italian Navy, the Italian ship yards are building many ships for foreign navies. They have at present in the docks: two cruisers of 6,800 tons and three submarines for the Argentine Republic; two torpedo boats for Greece; and two torpedo boats, two submarines, and three coast guards for Turkey.

The Italian press attaches great importance to these orders from foreign countries, these orders enabling Italy to develop its national industry and putting her in a position to build such ships as Italy might need in case of emergency.

The Monfalcone yards, at Trieste, launched the submarine *Squalo* on February 20. This ship is the first of four sisterships laid down in 1928, the details being as follows: length, 69.80 meters; width, 5.78 meters; draft, 4.75 meters; displacement, 875 tons on surface and 1,090 underwater. Two Diesel engines, developing a total of 3,000 hp., will give them a speed of 17.5 knots on surface; underwater speed is to be about 9 knots. The armament will include one 10-cm. gun and eight torpedo tubes of 550 mm.

On April 1, the submarine mine layer *Filippo Corridoni,* the last of the program of 1927, was launched at the Tosi yards, Taranto.

This ship is like the *Marcantonio Bragadino,* launched July 3, 1929. It displaces 825 tons on surface, 1,038 submerged. For running on the surface it has two Diesel engines with a total of 1,500 hp., giving the ship a maximum speed of 14 knots; for running underwater, it has two electric engines, 1,000 hp., speed 8 knots. It carries a 102 mm. gun, four torpedo tubes of 533 mm., and has two chutes for the laying of submarine mines.

The destroyer *Nicoloso da Recco* has made its trials in the course of which it appears to have attained a speed of 41.5 knots instead of 38 knots as provided for.

ENGINEERING AND RADIO

High-Pressure Steam and Electrical Drives

Engineering, April 18.—On the morning of Thursday, April 10, the chair was again taken by Admiral of the Fleet, the Right Hon. Lord Wester Wemyss, who called upon Dr. W. M. Meijer to read his paper on "Recent Results Obtained in Service with the High-Pressure Steam Installation of the Holland-American Liner *Statendam.*" A paper on "The Performance of Two Vessels with Electric Transmission Gear" was then read by Mr. W. J. Belsey, the President having announced that the two papers would be jointly discussed.

The discussion was opened by Mr. John Johnson, who said that the information given in Mr. Belsey's paper, together with that already published, enabled the position occupied by the *Viceroy of India* among modern tonnage of her class to be appreciated. The high efficiency of that vessel's water-tube boilers should allay any doubts that had existed on that score; and while the use of high-temperature steam raised the question of the reliability and maneuvering power of astern turbines, given suitable design, there did not appear any grounds for apprehension. On large steamers the maneuvering and reversal conditions were, however, on occasion very exacting, and there was no room for special tenderness in the ship when handling urgent orders. This was a point which needed close examination. He noticed that the *Viceroy of India* required seven operations to bring her to rest in 2 min. 10 sec. A vessel equipped with astern turbines could be stopped in 3 minutes or less, simply by closing one valve and opening another. As regarded the turbo-electric drive, though absence of noise and vibration were advantageous they were also obtainable with modern gear drives, and a more important point for the shipowner was the fuel consumption. Great interest, therefore, attached to the performance of

the *Viceroy of India* at low speeds, as it was at these that the virtues of the turbo-electric drive were supposed to be particularly evident. On a complete voyage the fuel consumption of the *Viceroy of India* was 0.702 lb. per s.hp. at an average speed of 16.33 knots, while the consumptions of the *Empress of Australia* and *Duchess of York*, vessels of comparable design, were 0.65 and 0.6 lb. per s.hp., hour at average speed of 19.25 and 18.2 knots, respectively. The Admiralty coefficients for these three vessels were 296, 285, and 284, respectively, at the speeds given. There would, therefore, appear to be an advantage of at least 12 per cent in favor of the geared drive at full power. In view of the claims made for electric transmission at reduced power, the performance of the *Viceroy of India* was disappointing, her fuel consumption being 0.775 lb. per s.hp., with one generator operating the two motors, as against 0.665 lb., with geared turbines running at half power. In fact, the results, using high-pressure steam and water-tube boilers, fell short of those obtained with a low-pressure installation, so that it must be assumed that the thermal advantages of the higher pressures were swallowed up by the electrical transmission losses. As regards reliability, twenty years' experience had not shown anything inherently unsound in the geared turbine, and any mishaps that did occur could be dealt with on board ship. It was doubtful whether this could be said of the higher speed turbines associated with the electric drive. In fact, turbo-electric propulsion must exhibit an overwhelming superiority in reliability and maintenance cost to overcome the disadvantages of its higher first cost and fuel consumption. There was no evidence that this superiority existed or was to be anticipated.

Technical Coördination

Marine Age, April 15.—Machinery has been set in motion for the bringing together of an international conference of marine technicians for the purpose of making important technical information in connection with model basin experiments and trial data available from one nation to another. At first glance the accomplishment of this result is quite an order although its achievement, at least in a large measure, is not at all impossible and is in addition very much to be desired.

Activity towards the result sought is fathered by Mr. John De Meo, a naval architect of international experience ranging through all classes and grades of ship work for over thirty years. Mr. De Meo's reputation is well known in Italy, France, Great Britain, Japan, Germany, and the United States, especially by engineers of the older school, and many will recall him as a prime mover in the establishment of ship registration and classification bureaus and the coördination of effort along these lines. All will admit that success has crowned those energies.

Briefly, Mr. De Meo now proposes an amicable interchange of technical information and scientific data for the benefit of the science of engineering regardless of nationality, the benefits to be passed along to the shipowner, the ship builder and ultimately to those who work or travel on the sea. Because of the practice of secretiveness in vogue for example on many tank tests, new propulsion ideas, etc., naval architecture has advanced but little during past years, much to the detriment of all shipping nations. Bearing in mind that transportation by sea has before it a most difficult period of development—and there must be development if this mode of travel is to hold its place—the plan presented for international coöperation is worthy of more than passing note by all the maritime nations as all will be effected.

The problem of propulsion has always been (and probably always will be) a moot question. With the results of research and experiment more or less buried in secrecy, however, the science of marine engineering must suffer and glaring, costly mistakes will continue to be made. Availability of data between the experts of the several marine countries of the world would, if practiced during the past few years, have brought all nations today many leagues nearer a successful solution of such vexing problems as propelling engines, proper propellers and ship designs, elimination of vibration, type and size of ships for maximum earning power and similar points which must now be cleared at great expense of time and money.

The plan put forward by Mr. De Meo is outlined with full recognition of the hu-

man equasion entering into professional and scientific matters, namely, that it will be no easy task to bring technically trained minds of several nations together in complete accord at all times although, at the same time, it is realized that if anything of the nature proposed is to be accomplished it must be from the broad point of view that nations rather than individuals are to derive the greatest benefit. There is also universal appreciation of the fact that to reach the desired goal there must be a beginning and Mr. De Meo evidently has the necessary courage of his convictions to take the lead in an international movement to see what can be done.

As set forth in our March 15 issue the idea of international marine technical coordination already had the approval of many men of high professional standing abroad and at home and during the past two weeks many others have added themselves to this list.

Because of the extensive scope of the proposition considerable time will be required to bring about crystallization but at least a start has been made and that is commendable.

The Photo-electric Cell

Mechanical Engineer, May.—While based on an entirely different principle, the photo-electric cell is a development of the original idea embodied in the selenium cell, namely, response to variations in light. Unlike the selenium cell, however, whose response is comparatively crude, the photo-electric cell can be made extremely sensitive. It has been already applied to a number of applications of various kinds. In the Holland Tunnel connecting New York City and Jersey City, it is used to detect fumes in the air which affect the cell by reducing the illumination striking it from a specially set lamp.

In Germany an even more ambitious use of it is made. There they have developed a method of train control in which a train passing a certain point cuts off the light to a photo-electric cell and in this way operates the various switches.

It is proposed to use the photo-electric cell as a protection for safes by locating sources of light at various points in the room. Anyone then attempting to approach the safe will cut off the rays from one or more of these sources, which will actuate the cell in the safe door and signal the proper persons that a burglar is around. Of course if the burglar is clever enough he may be able to circumvent this by locating one or more lamps of his own in such a way that the photo-electric cell will not operate.

In mechanical engineering the applications of the photo-electric cell have not yet been numerous, and yet there are possibilities. It is therefore of considerable importance that the mechanical engineer shall study this little device and thoroughly understand its workings. The cell has already been developed to an extent where it is quite reliable in operation, and therefore it is not necessary for him to bother much with its underlying theory. He should, however, thoroughly understand the conditions under which it works, and particularly its great sensitivity, for the device apparently responds to extremely slight variations in lighting power, as shown, for example, by the fact that it is used for automatically sorting tobacco leaves for cigar manufacture. In this case the photo-electric cell matches colors and throws out of line all the leaves that are either too dark or too light. Its use for detecting fumes has been already referred to; that for detecting vibrations in running machinery is being studied.

MERCHANT MARINE

New Liners and the Conference

Merchant Shipping Review, March, 1930.—The suggestion that the way is now clear for the construction of the two giant new express steamers for the United States Line's New York-Southampton service comes at a rather embarrassing moment for the disarmament conference, for one of the first things that Japan did was to add to the agenda the question of liners as auxiliary cruisers, particularly those fitted to carry aircraft.

The number of regularly built aircraft carriers possessed by each navy is strictly limited under the original Washington disarmament treaty, and recently naval opinion in Japan has been very seriously disturbed by the prospect of the United States and the European powers being able to commission a number of auxiliary aircraft carriers while Japan cannot.

To be of any real use carrying aircraft to the fleet, the carrier must be both large and fast, large to permit the construction of a flying-on deck that will allow spent aircraft to land and fast because the nature of her duties demands that she shall be at least two knots faster than the battleships with which she operates, unless the admiral is to detach a large part of his fleet for her protection.

The Japanese Mercantile Marine, large as it is, does not contain any liners suitable for conversion to this service, for such ships could only really pay on the North Atlantic. Her biggest liner is only about 17,000 tons and Japan's ocean services call for a very much lower speed than the North Atlantic.

Attention has already been called to the fact that the North German Lloyd flyer *Bremen* is an ideal auxiliary aircraft carrier, for she already launches mail machines by means of the catapult between her funnels and the after superstructure of the vessel is so constructed that it would only require a very short time to convert it into a big flying-on deck.

Her speed is all that is required and as every German hopes and anticipates that the naval clauses in the Treaty of Versailles will be scrapped and that she will again be allowed to own aircraft, the conversion of the *Bremen* and *Europa* has already entered into the calculations of the naval experts.

American theorists have also given careful attention to the possibilities of liners as auxiliary aircraft carriers and when the Atlantic Blue Riband Line was projected with ships of over 30 knots it was this function that was advanced strongly as an argument for government aid for the scheme.

That being so it is not difficult to understand how the publication of the details of the projected ships, a gross tonnage of between 50,000 and 60,000 and a speed of 28½ knots, has perturbed the Japanese, who see in it a strong possibility of their being dropped into an inferior position in this important branch of the service.

They are therefore prepared, it is understood, to take a very firm stand on the subject of the conversion of merchantmen into men-of-war, particularly for carrying aircraft but also for the cruiser purposes in which they did very well during the struggle with Germany.

Hog Island Property as Air, Marine, Rail Terminal

Nautical Gazette, April 12.—The sale of Hog Island to the City of Philadelphia under a contract which provides for development of the property as a marine, air, and rail terminal for the sum of $3,000,000 was authorized by the Shipping Board April 9. The Merchant Fleet Corporation, as the Board's agent, will consummate the sale, the final contract to be submitted to the Board for approval.

The terms of sale require a down payment by the city of $450,000, and a guarantee that the sum of $500,000 will be expended at once for grading the portion of the land to be used as an airport. It is likewise provided that improvements to the water front will be undertaken on the responsibilty of the city. During the first ten years of the city's ownership of the property the amount of 3 per cent per annum will be paid on the unpaid balance of principal as ground rental on interest and during the following ten-year period, or until the entire principal sum shall have been paid, the amount of 6 per cent per annum will constitute this rental.

At the northerly end of the island's water front a seaplane landing basin having shore frontage of 1,400 feet has been provided, leaving approximately 13,000 feet of water front for the marine terminal features of the project. All the area immediately back of this strip has been reserved for rail terminals and warehouses, and the remaining 307 acres of "backland" will constitute the airport.

Consummation of the sale of this property is another achievement for the Gordon régime, which has from the first showed a disposition to liquidate government-owned marine property.

Philadelphia has been negotiating for the Hog Island site for many months.

When Our Ships Led

Washington *Post,* March 31. By Commander H. H. Frost, U.S. Navy.—Recently the attention of the world has been focused on the successive record-breaking crossings of the *Bremen* and *Europa.* This peaceful victory over their British rivals brings to mind those glorious years when the beautiful ships of our Collins Line won similar successes.

Few know now that it was an American steamship which first crossed the Atlantic. This was the side-wheeler *Savannah*. After a voyage of 25 days from the city whose name she bore this strange craft astonished the British by appearing in the harbor of Liverpool on June 20, 1819. "She is a fine ship of 320 tons burden," wrote our minister at London, "and exhibits in her construction, no less than she has done in her navigation across the Atlantic, a signal trophy of American enterprise and skill upon the seas." This sounds much like those compliments which are now being showered upon those responsible for the successes of the giant German liners.

Despite the success of the *Savannah's* cruise, twenty years passed before its obvious lesson was taken to heart. Then it was England which profited from this practical demonstration of American enterprise. Finding that they could not compete with American sailing ships, the British in 1839 awarded a mail-carrying subsidy of $425,000 a year to Samuel Cunard for the transatlantic run. The next year the Cunard company put four steamers on this route. Their tonnage was about 1,150; horsepower, 400, and speed 8½ knots. In 1844 two more ships were added and in 1848 four. These last were of 1,820 tons and could make all of 10¼ knots. So completely did the Cunard fleet gain the fast passenger trade for England that the government gratefully doubled the subsidy.

Americans first met this competition with larger and faster sailing packets. But it soon was seen that we would have to go into the steamship game if we were to regain our supremacy on the high seas. But we could not run steamers in competition with the Cunarders unless we also were assisted by a government subsidy. In 1845 Senator King, of Georgia, summarized the situation and urged a subsidy, which was granted by Congress. This action was highly approved by President Polk.

The effects of the mail subsidy were immediate and remarkable. Soon we had steam mailships plying from New York to Bremen, Havre, the West Indies, and the Isthmus of Panama. Another line ran between Panama and Oregon and played a great part in opening up the immensely valuable West Coast.

But the greatest results came from the contract which the government signed in November, 1847, with Edward K. Collins. For the annual subsidy of $385,000 Collins was to build steamers of 2,000 tons or over and make twenty mail trips annually between New York and Liverpool. Collins was a man of great ability and exalted patriotism. So determined was he to regain the fast passenger trade for America that he spared no expense to construct the finest ships afloat and operate them with the best seamen and engineers in the world. Every cent of profit his company made was used to improve the fleet. Not a single dividend did the stockholders draw from his patriotic venture.

In 1850 Collins commenced his service with four ships: *Arctic, Atlantic, Baltic,* and *Pacific*. They were by far the largest ships then afloat, measuring about 2,800 tons. The chief engineer of the Navy had designed their splendid 800-horsepower engines. With a pressure of seventeen pounds of steam per square inch they could make the then enormous speed of 13 knots. In comfort and beauty of construction they stood apart in the world.

These magnificent liners soon won all the transatlantic speed records. They were a whole day faster than the Cunarders. Eastbound, they averaged through the year 10 days and 21 hours, and westbound, 11 days and 3 hours. In May, 1851, the *Pacific* ran from New York to Liverpool in 9 days 20 hours and 16 minutes. In July, 1852, the *Arctic* eclipsed this record with a run of 9 days 17 hours and 12 minutes. How we took the trade from the Cunarders is shown by a statement in the New York *Herald:* Between January and November, 1852, the four Collins liners carried 4,306 passengers; the seven boats of the Cunard Line, 2,969.

The Collins Line brought another advantage to American merchants. The Cunard had previously enjoyed a monopoly in fast transatlantic freight. In two years they were forced by American competition to cut their freight rates in half. In recognition of these advantages Congress increased the subsidy to $858,000.

Despite the 10-year start of the British shipping companies, our deep-sea steam tonnage had virtually equaled theirs by 1851, and our ships were better in every respect.

In 1854 the series of misfortunes which were to ruin the Collins Line commenced. The splendid *Arctic* was rammed and sunk by a French steamer off Cape Race. Nothing daunted, Collins commenced the construction of the gigantic *Adriatic*, 4,144 tons, to take her place. But in 1855, only a month after her launch, Congress commenced a move to abolish the mail subsidy. Bitterness between the North and South spelled the ruin of our great merchant marine. The Southerners declared that they were obtaining no benefit from the subsidies, as all the steamers were operated from Northern ports—the very ones, as it happened, where antislavery sentiment was strongest. They also feared that these fine steamers would be taken over by the Navy and used against them in case of secession. In 1856 Congress reduced the subsidy of the Collins Line again to $385,000. To cap the climax the steamer *Pacific* disappeared at sea, without a trace. For two more years our ship owners fought it out, but it obviously was a losing game. In 1858 Congress made a further cut in the subsidies. The Collins Line sued for bankruptcy. The beautiful *Adriatic* was sold to a British company. At the end of 1861 the United States flag had vanished from the steam routes of the Atlantic. The knell of the American merchant marine had been sounded.

In recent years the necessity for a merchant marine has again been recognized by merchants and statesmen. Our government is prepared to give American ship owners the support it so unfortunately withdrew in those fateful years before the Civil War. Perhaps the memory of those days when we held all records for the Atlantic ranks may induce some of our leaders of industry to organize another Collins Line—even if it offers no immediate prospect of earning dividends.

For many of the facts in this story I am indebted to W. L. Marvin, author of that excellent book, *The American Merchant Marine*.

AVIATION

Expansion of Japanese Naval Aviation Forces

New York *Times*, April 6.—Japanese naval officials are reported to be planning a demand that part of the savings likely to be effected by the naval agreement be used for increased naval air forces.

It has been suggested they intend expanding the present seventeen squadrons of naval aircraft to twenty-eight, which would represent an increase of approximately 1,000 machines at a cost of 60,000,000 yen (about $30,000,000). These would be used to make good the loss to national defense resulting from reduction in the number of submarines.

In well-informed circles these reports are regarded as based on "intelligent anticipation."

Premier Hamaguchi, speaking to newspaper men today, said the government had not yet considered any such proposal, though he added the Vice Minister of the Navy had suggested that part of the funds likely to be saved should be devoted to improvement in the naval air defense.

It is generally believed that the main saving, estimated at more than 100,000,000 yen annually will be devoted to decreasing taxation and relieving unemployment.

Premier Hamaguchi, who was entraining at Tokio for Okitsu to visit the sick Prince Saionji, said the government was confident of an early conclusion of a tripartite naval treaty at London, although it was still awaiting word on a final agreement concerning Japan's submarine fleet.

Naval spokesmen said the Navy had not yet drafted the new air program but must consider means of increasing the efficiency of its weapons in view of the impending reduction of warcraft tonnage.

The Elgin Instrument Panel

Aero Digest, April.—A new aircraft instrument panel has been developed by the Elgin National Watch Company. The panel includes tachometer, air-speed indicator, compass, altimeter, pressure gage, thermometer, ice-warning indicator, clock, and turn and bank indicator.

The chassis of the air-speed indicator and the altimeter are made of one-piece castings to provide rigidity and alignment. These two instruments are equipped with four jewels similar to those used in watch mechanisms.

Below the compass a frame retains the card for noting corrections of the compass course due to magnetic deviation.

ELGIN AIRPLANE PANEL UNIT CONTAINING FLYING AND ENGINE INSTRUMENTS

British Naval Air Activities

Army, Navy and Air Force Gazette, March 13.—The amount of flying carried out by embarked aircraft shows steady increase; 82 naval officers are now employed as observers and 6 more are under training (corresponding figures in 1929 were 74 trained and 8 under training), while 120 naval and marine officers are serving as pilots in the Fleet Air Arm and 29 are under training (the 1929 figures were 121 trained and 12 training).

Automatically Controlled Parachutes

Army, Navy and Air Force Gazette, March 13.—Experiments are being conducted by the Royal Air Force with automatically controlled parachutes and containers for dropping supplies and ammunition. The aim is to obtain an apparatus which can be launched with accuracy like a bomb, but which for the last part of its descent will fall slowly, so that its contents are undamaged. Two devices which are under test are thus described by the Aeronautical Correspondent of the *Morning Post:* One is a high velocity "dropper," which is opened by clockwork after it has fallen a predetermined time. The parachute is kept closed for as long as possible to increase the accuracy of aim. The other device is the Holt "dropper," which is designed to open its parachute automatically at a certain height above the ground. It actually measures its own height from the ground by a length of cable. Both these devices can be used for mail dropping.

Contact Courses in the Air Corps

Aero Digest, April.—Contact courses will be established whenever possible for Air Corps officers and officers of other branches of the Army, according to an authorization of the War Department to corps area and departmental commanders to attach Air Corps officers in their commands to units of ground arms for brief periods and to attach ground arms officers to units of the Air Corps. The purpose of these courses is to develop tactical coöperation between the aviation and ground branches of service.

Air Corps officers who are detached from units of the Air Corps for this purpose will be allowed opportunities to qualify for and retain their flying pay status. The officers of ground arms attached to units of the Air Corps, as authorized, will not be placed on a flying status for pay purposes, insufficiency of funds preventing this. Their participation in flights while on such duty will be optional.

Corps area and department commanders will report on July 1 to the adjutant

general the number, rank, and arms of officers detached under the provisions of these contact courses, and report their findings on the practicability and value of the plan.

Aviation Physical Examinations for West Point Cadets

Aero Digest, April.—Physical examinations of 211 cadets out of 247 in the graduating class of the U. S. Military Academy applying for commissions in the Air Corps next June were recently completed by a board of five flight surgeons under the supervision of Major C. W. Cummings. Seventy-nine of the cadets examined failed to pass examination, according to members of the board which has been in session at West Point since February 3. Ninety-one cadets qualified for flight training, ten were previously accepted, and thirty-one had minor defects which must be waived by the Chief of the Air Corps before they will be admitted to the Air Corps flying schools.

Test of Martin Experimental Torpedo Plane

Aviation, April 5.—Power dives in the neighborhood of the 6,000-ft. length were completed successfully by William H. McAvoy, N.A.C.A. test pilot, in this new Martin torpedo plane in the recent tests before naval officials at Anacostia, D.C. Starting from the 12,000-ft. level, McAvoy several times hurtled down and pulled out sharply without releasing the 1,000-lb. dummy bomb. A passenger accompanied him in the tests.

Wings experimented with last fall were found to be insufficiently strong for the long dives with the 1,000-lb. bomb, but alterations materially strengthened them. Although under ordinary circumstances the bomb would be released at the end of the dive, enough reserve strength was built into the plane to enable the pilot to pull out with ease while still carrying the bomb, thus enabling him to try again for his mark as well as protecting him against such contingencies as failure of the release mechanism.

Commander J. H. Towers, acting chief of the Bureau of Aeronautics, Navy Department, expressed pleasure at the performance of the new Pratt and Whitney Hornet-powered torpedo plane.

Influence of Sound upon Aviators

New York *Times,* April 20.—A series of tests to determine the effect of aircraft motor noise on the ears of aviators, and whether it limits their ability to receive faint radio signals while in flight, has been started by engineers of the Naval Research Laboratory, Anacostia, D.C. Of the human senses used in flying, probably none is subjected to conditions more unusual than that of hearing, according to C. B. Mirick, navy engineer, in a report made before the Institute of Radio Engineers.

An instrument called the audiometer, developed by the Bell Telephone Laboratories, New York, was used to measure, both before and after periods of flight, the sensitivity of the ear drums of a picked group of fliers. The hearing of the aviators was measured in terms of "sensation units" of sound. Besides actual sound waves, other things which affect the hearing of the fliers are temperature and pressure changes, which may vary rapidly in flight.

From the experiments Mr. Mirick arrived at the conclusion that radio sets for aircraft should be designed to give louder signals in the headphones. He reasons that the radio operator should be deaf enough to render his hearing somewhat immune to sounds from the motor exhaust and other noises, and that the signal be made louder to compensate for the deficient hearing.

The tests revealed definite evidence of ear-drum fatigue after flight, but that the fatigue did not appear to affect the operator's ability to hear equally well various tones or pitches. No evidence was discovered of fatigue being produced during actual flying, by flight noises. However, Mr. Mirick reported discovery of evidence indicating a small but definite permanent general loss of hearing among experienced aviators. Some aviators, however, had perfect hearing, and the losses occurred only on the high frequencies or high tones.

Each of the aviators selected for the tests had flown for a period of years, representing time in the air of 1,000 or more hours. They showed fairly normal hearing. Mr. Mirick reported:

> Weighing all the evidence it seems doubtful that flight noises alone will produce any cumulative action which would affect the efficiency of a radio operator during even the longest flights.

However, there is still a possibility that such a cumulative effect may result indirectly from the abnormally loud signals required in the telephone to get through the masking of flight noises. It has been noted that a voltage of one-half to one volt at telephones is required to be audible in flight, and that during flight such a signal is barely audible, while a signal of equal strength on the ground seems almost intolerably loud to the normal ear. There is no evidence that fatigue is noticeably intensified at any particular frequency. Neither is one conscious of any excessively pronounced pitch when listening to flight noises.

The right ear of one aviator tested showed a marked gain in hearing after a short flight at a high altitude, while the left ear showed no such effect. Mr. Mirick suggested that the rapid pressure variation due to a quick change in altitude as the plane soared upward may have cleared up a stoppage. He cited the incident to "throw light on claims advanced of deafness cures produced by flying."

The Latest Aircraft Carrier

The Aeroplane, April 9.—Extensive trials were made on March 24 at Rothesay of the new aircraft carrier, H.M.S. *Glorious.* She is said to have attained a speed of 35 knots. If this is correct she is, with the exception of destroyers, the fastest warship in the world, as the speed record for capital ships is held by H.M.S. *Hood,* which made 32.07 knots on her trials.

The American aircraft carrier, *Lexington,* is known to have steamed at 34½ knots.

H.M.S. *Glorious* returned to Portsmouth on March 30 on completion of her trials and will be at Devonport from April 9 to April 25. She will replace H.M.S. *Courageous* in the Mediterranean Fleet at the end of June.

The Fleet Air Arm complement in H.M.S. *Glorious* will consist of seven flights, two of which, No. 406 (fleet fighter) Flight (flycatchers), and No. 408 (fleet fighter) Flight (flycatchers), have already embarked. The other flights will be No. 405 (fleet fighter) Flight (flycatchers) from H.M.S. *Furious,* No. 441 (fleet spotter reconnaissance) Flight (Fairey III.Fs) from H.M.S. *Argus,* No. 447 (fleet spotter reconnaissance) Flight (Fairey III.Fs) from H.M.S. *Furious,* No. 461 (fleet torpedo bomber) (Darts) from H.M.S. *Furious,* and No. 462 (fleet torpedo bomber) Flight (Ripons) from H.M.S. *Furious.*

Pan American Airways Plan New Route over Caribbean

Aviation, April 19.—Pan-American Airways has announced plans for a new route between this country and the Canal Zone for its mail planes, the new itinerary to go into effect April 26 with the inauguration of its proposed seven-day service between New York and Buenos Aires and Montevideo. Practically a direct flight across the Caribbean will be made instead of a swing through Central American countries between Belize, British Honduras, and the Canal Zone, as in the past. Under the new plan the planes will be flown 600 miles across the Caribbean from Havana to Cape Gracias a Dios, on the northeastern coast of Nicaragua, and thence across 400 more miles of sea to France Field. This flight will be made between 6:00 A.M. and 6:00 P.M.

Inauguration of such a straight-line route has been under consideration for some time and has been mentioned in connection with the proposed use of the Sikorsky S-40 4-engined amphibian now in the process of development at Bridgeport, Connecticut. Two whole days will be saved over the present route. Practically the same schedule for the seven-day service will be in effect as announced in the April 12 issue of *Aviation.* The first plane will take off from Miami on April 26 and the mail is expected to reach Buenos Aires on May 2.

The planes will make but one stop between Havana and Cristobal (France Field). For this stop a field at Tuapi Lagoon, about 50 miles south of Cape Gracias a Dios will be used. This field was started by the Bragman-Buff Lumber Company for its own use and was developed by the Marine Corps, which installed a hangar. Pan-American has installed a fueling system. The Sikorsky S-38 will be used.

In connection with the launching of this service, Pan-American, in coöperation with other air mail operators throughout the country and city officials, has launched a campaign to observe April 25 as Latin American-United States Air Mail Day. This is the day on which mail from distant sections of the country should be mailed to be included in the first flight.

New Feed System for Aviation Engines

Aviation, April 19.—A device which eliminates the usual carburetor and intake

system of the gasoline engine and permits the use of fuel ranging from ordinary furnace oil to high-test aviation gasoline has been perfected by the Pratt and Whitney Aircraft Company, and was demonstrated last week at Brainard Field before aviation officials and newspaper men.

While the device has been developed from the point of view of the aviation engine, it is equally adaptable to automobile or other gasoline engines, according to Pratt and Whitney officials. It has been used successfully for 6,000 miles in an old model-T Ford.

The new system was demonstrated on a standard Pratt and Whitney Wasp from which the carburetor had been removed. The engine powered a Boeing pursuit plane, which was put through most exacting military maneuvers by Lieutenant A. Lewis MacClain, test pilot of the company. The device substitutes atomization for carburetion and measures the fuel precisely, delivering it mechanically to each cylinder through independent lines.

So complete is the atomization that the highest- and the lowest-test fuel may be used. In the tests, aviation gasoline was carried in one tank and furnace oil in another. While engaged in maneuvers, Lieutenant MacClain changed at will from one to the other tank.

Pratt and Whitney engineers say that the system, when using gasoline, develops greater power than the ordinary system of carburetion and provides efficient operation regardless of the temperature of the engine or its position in the air. During the tests, the pilot idled the engine at a high altitude and thoroughly cooled the engine. As he neared the ground with the air screw barely turning over, he "gunned" the engine and climbed steeply to about 2,000 feet. There was no sputter, as is usually heard with a cold power plant. This test was made with both furnace oil and gasoline. With this device, cold starting is greatly facilitated, and the difficulty previously encountered with ice formation in the carburetors during winter operation is believed to be eliminated.

The fuel is sprayed into each cylinder, where it is mixed with air from the intake valve. High-pressure pumps force the fuel into the head of each cylinder. The throttle controls both the fuel stream and the air to the intake valve.

These pumps, and the absence of the carburetor and float, make it possible to fly the plane in any possible position without loss of power. Pilot MacClain flew for a considerable time in inverted flight during the tests, with the engine functioning perfectly. Each test was repeated with furnace oil as fuel.

A point of utmost importance in aviation is the fact that no weight is added to the power plant with the new Pratt and Whitney device. The equipment replacing the carburetor system weighs approximately the same, and the horsepower remains identical.

The device was originally evolved by Stephen A. Hasbrouck, an engineer of the Pratt and Whitney Company, and has been developed by the company engineers under the direction of George J. Mead, vice-president in charge of engineering. The device is covered by patents of Mr. Hasbrouck and others pending by the company's engineering department.

The new system will not be put into production for six months or more, according to Mr. Mead, as the company will follow its usual practice and test the new feature extensively in all parts of the country under all flying conditions, before offering it as regular equipment.

While the tests have so far been made with a standard Wasp, the engineers intimated that the engine itself will be developed to give the utmost efficiency with the new device.

Personnel Strength of Army Air Corps

Baltimore *Sun*, April 23.—Mather Field, Sacramento, California.—At conclusion of its five-year program, 2,500 flying officers and 16,000 enlisted men are expected to constitute the personnel of the United States Army Air Corps, Major General James E. Fechet, corps commander, declared today.

General Fechet, who is here observing the army air maneuvers, said when the corps is complete, as planned on paper, there will be four provisional wings in place of the existing single wing, probably distributed as follows:

A bombardment wing on the Pacific Coast, likely at March Field, Riverside County; an attack wing at Fort Crockett,

Texas; a pursuit wing in the Middle West, probably at Selfridge Field, Michigan, and another bombardment wing on the Atlantic seaboard.

Commander Burney on Aircraft and the Navy

Army, Navy and Air Force Gazette, April 10.—Commander Sir Dennistoun Burney's lecture at the Royal United Service Institution last month on "The Influence of Aircraft on Sea Power" was marked by a soundness of view which is not always apparent in discussions on this subject. He is a gifted officer who has had the advantage of both naval and air experience, and does not, like some so-called authorities, regard the naval arm as likely to be superseded, at least for some generations, by that aloft. He contends that in future Great Britain would require a larger instead of a smaller Navy if she were to maintain a sea strength adequate to requirements of imperial defence, and he gave reasons for this view. But in the face of international agreements and financial stringency, a larger Navy is out of the question. Therefore, the Navy must look to the Air Force for assistance. "Air Power," says Sir Dennistoun Burney, "has not destroyed the utility of navies, but is forcing into being a new type of Navy of which aircraft will be an indispensable part." This is manifestly true, and the most natural comment is that the part played by aircraft in the Navy today ought to be larger. The present strength of only twelve squadrons in the Fleet Air Arm, and only 120 naval pilots and 82 naval observers, makes a poor comparison with developments in other countries, especially the five-year program for a thousand machines in the United States.

Independent Air Force Operations

Aviation, April 26.—Gratifying success has rewarded the second and third weeks of the United States Army Air Corps' 1930 tactical maneuvers, during which practically all recent developments in tactics and equipment have been proved of practical value under actual conditions of warfare. No accidents of a serious nature have marred any of the exercises and the First Provisional Wing, under command of Brigadier General William E. Gillmore, has demonstrated that the Air Corps can operate effectively independent of any coöperation from ground forces.

Following the first week, which was largely devoted to airdrome discipline and group training, the First Provisional Wing swung into a program of tactical problems which have involved extended maneuvers in attack and defense, missions conducted under sealed orders and by radio direction from ground bases, and from the air, experiments in night bombing, night photography, smoke screen employment, high altitude formation flying, and extended cross country flights with the Army's new "robot" pilot, the mechaviator.

Maneuvers have included attack of pursuit group against pursuit group, pursuit attacks on bombers and observation planes, air force attacks on railroad bridges, bombardment and attacks on various rail junctions and moving trains throughout central California, air force attacks on enemy airdromes at dawn, and simulated attacks on enemy shipping just outside the entrance to San Francisco Bay.

On April 8, Major Willis Hale, flying a Boeing P-12 pursuit plane, blanketed the entire area of Mather Field with a smoke screen as a protection against enemy attack. On April 9 the California State Capitol building was so effectively covered with a smoke screen by Captain Victor H. Strahm, that practically all traffic in the downtown streets was stopped for a half hour. The entire force coöperated in the dedication of the new Sacramento Airport on April 12 and 13. On April 12 the entire 95th Pursuit squadron under command of Captain Hugh M. Elmendorff flew in formation to an altitude of 25,000 feet. Equipment for this flight included oxygen apparatus and especially heated garments. The remainder of the third week of the maneuvers was devoted to individual squadron missions with the exception of a special flight of a Curtiss Condor from Sacramento to San Francisco and return piloted by the Army's mechaviator.

NOTES ON INTERNATIONAL AFFAIRS

From April 4 to May 3

Prepared by Professor Allan Westcott, U. S. Naval Academy

COMPLETE TEXT OF THE NAVAL TREATY OF 1930

The full text of the London Naval Treaty was made public by the State Department recently, as follows:

TREATY BETWEEN THE UNITED STATES, FRANCE, THE BRITISH EMPIRE, ITALY, AND JAPAN FOR THE LIMITATION AND REDUCTION OF NAVAL ARMAMENT SIGNED AT LONDON, APRIL 22, 1930.

Part I

Article I

The high contracting parties agree not to exercise their rights to lay down the keels of capital ship replacement tonnage during the years 1931-1936, inclusive, as provided in Chapter II, Part 3, of the Treaty for the Limitation of Naval Armament signed between them at Washington on the sixth of February, 1922, and referred to in the present treaty as the Washington treaty.

This provision is without prejudice to the disposition relating to the replacement of ships accidentally lost or destroyed contained in Chapter II, Part 3, Section I, Paragraph (c) of the said treaty.

France and Italy may, however, build the replacement tonnage which they were entitled to lay down in 1927 and 1929 in accordance with the provisions of the said treaty.

Article II

1. The United States, the United Kingdom of Great Britain and Northern Ireland, and Japan shall dispose of the following capital ships as provided in this article:

United States: *Florida, Utah, Arkansas* or *Wyoming;*

United Kingdom: *Benbow, Iron Duke, Marlborough, Emperor of India, Tiger;*

Japan: *Hiyei.*

(a) Subject to the provisions of sub-paragraph (b), the above ships, unless converted to target use exclusively in accordance with Chapter II, Part 2, Paragraph II (c) of the Washington treaty, shall be scrapped in the following manner:

One of the ships to be scrapped by the United States, and two of those to be scrapped by the United Kingdom, shall be rendered unfit for warlike service, in accordance with Chapter II, Part 2, Paragraph III (b) of the Washington treaty, within twelve months from the coming into force of the present treaty. These ships shall be finally scrapped, in accordance with Paragraph II (a) or (b) of the said Part 2, within twenty-four months of the said coming into force. In the case of the second of the ships to be scrapped by the United States and of the third and fourth of the ships to be scrapped by the United Kingdom, the said periods shall be eighteen and thirty months respectively from the coming into force of the present treaty.

(b) Of the ships to be disposed of under this article, the following may be retained for training purposes:

By the United States: *Arkansas* or *Wyoming.*

By the United Kingdom: *Iron Duke.*

By Japan: *Hiyei.*

These ships shall be reduced to the condition prescribed in Section V of Annex II to Part 2 of the present treaty. The work of reducing these vessels to the required condition shall begin in the case of the United States and the United Kingdom within twelve months, and in the case of Japan within eight months from the coming into force of the present treaty; the work shall be completed within six months of the expiration of the above-mentioned periods.

Any of these ships which are not retained for training purposes shall be rendered unfit for warlike service within eighteen months, and finally scrapped within thirty months, of the coming into force of the present treaty.

2. Subject to any disposal of capital ships which might be necessitated, in accordance with the Washington treaty, by building by France or Italy of the replacement tonnage referred to in Article I of the present treaty, all existing capital ships mentioned in Chapter II, Part 3, Section II of the Washington treaty and not designated above to be disposed of may be retained during the term of the present treaty.

3. The right of replacement is not lost by delay in laying down replacement tonnage, and the old vessel may be retained until replaced, even though due for scrapping under Chapter II, Part 3, Section II of the Washington treaty.

Article III

1. For the purpose of the Washington treaty, the definition of an aircraft carrier given in Chapter 2, Part 4, of the said treaty is hereby replaced by the following definition:

The expression "aircraft carrier" includes any surface vessel of war, whatever its displacement, designed for the specific and exclusive purpose of carrying aircraft and so constructed that aircraft can be launched therefrom and landed thereon.

2. The fitting of a landing-on or flying-off platform or deck on a capital ship, cruiser, or destroyer, provided such vessel was not designed or adapted exclusively as an aircraft carrier, shall not cause any vessel so fitted to be charged to or classified in the category of aircaft carriers.

3. No existing capital ship shall be fitted with a landing-on platform or deck.

Article IV

1. No aircraft carrier of 10,000 tons (10,160 metric tons) or less standard displacement mounting a gun above 6.1 inches (155 mm.) caliber shall be acquired by, or constructed by or for, any of the high contracting parties.

2. As from the coming into force of the present treaty in respect of all the high contracting parties, no aircraft carrier of 10,000 tons (10,160 metric tons) or less standard displacement, mounting a gun in excess of 6.1 inches (155 mm.) shall be constructed within the jurisdiction of any of the high contracting parties.

Article V

An aircraft carrier must not be designed and constructed for carrying a more powerful armament than that authorized by Article IX or Article X of the Washington treaty, or by Article IV of the present treaty, as the case may be. Wherever in the said Article IX and X of the Washington treaty the caliber of 6.0 inches (152 mm.) is mentioned, the caliber of 6.1 inches (155 mm.) is substituted therefor.

Part 2

Article VI

1. The rules for determining standard displacement prescribed in Chapter 2, Part 4 of the Washington treaty shall apply to all surface vessels of war of each of the high contracting parties.

2. The standard displacement of a submarine is the surface displacement of the vessel complete (exclusive of the water in non-water-tight structure) fully manned, engined, and equipped ready for sea, including all armament and ammunition, equipment, outfit, provisions for crew, miscellaneous stores, and implements of every description that are intended to be carried in war, but without fuel, lubricating oil, fresh water, or ballast water of any kind on board.

3. Each naval combatant vessel shall be rated at its displacement tonnage when in the standard condition. The word "ton," except in the expression "metric tons," shall be understood to be the ton of 2,240 pounds (1,016 kilos).

Article VII

1. No submarine the standard displacement of which exceeds 2,000 tons (2,032 metric tons) or with a gun above 5.1 inches (130 mm.) caliber shall be acquired by or constructed by or for any of the high contracting parties.

2. The high contracting parties may, however, retain, build or acquire a maximum number of three submarines of a standard displacement not exceeding 2,800 tons (2,845 metric tons); these submarines may carry guns not above 6.1 inches (155 mm.) caliber. Within this number, France may retain one unit, already launched, of 2,880 tons (2,926 metric tons), with guns the caliber of which is 8 inches (203 mm.).

3. The high contracting parties may retain the submarines which they possessed on April 1, 1930, having a standard displacement not in excess of 2,000 tons (2,032 metric tons) and armed with guns above 5.1 inches (130 mm.) caliber.

4. As from the coming into force of the present treaty in respect of all the high contracting parties, no submarine the standard displacement of which exceeds 2,000 tons (2,032 metric tons) or with a gun above 5.1 inches (130 mm.) caliber shall be constructed within the jurisdiction of any of the high contracting parties, except as provided in Paragraph 2 of this article.

Article VIII

Subject to any special agreements which may submit them to limitation, the following vessels are exempt from limitation:

(a) Naval surface combatant vessels of 600 tons (610 metric tons) standard displacement and under.

(b) Naval surface combatant vessels exceeding 600 tons (610 metric tons), but not exceeding 2,000 tons (2,032 metric tons) standard displacement, provided they have none of the following characteristics:

(1) Mount a gun above 6.1 inches (155 mm.) caliber.
(2) Mount more than four guns above 3 inches (76 mm.) caliber.
(3) Are designed or fitted to launch torpedoes.
(4) Are designed for a speed greater than twenty knots.

(c) Naval surface vessels not specifically built as fighting ships which are employed on fleet duties or as troop transports or in some other way than as fighting ships, provided they have none of the following characteristics:

(1) Mount a gun above 6.1 inches (155 mm.) caliber.
(2) Mount more than four guns above 3 inch (76 mm.) caliber.
(3) Are designed or fitted to launch torpedoes.
(4) Are designed for a speed greater than twenty knots.
(5) Are protected by armor plate.
(6) Are designed or fitted to launch mines.
(7) Are fitted to receive airplanes on board from the air.
(8) Mount more than one airplane-launching apparatus on the center line; or two, one on each broadside.
(9) If fitted with any means of launching airplanes into the air, are designed or adapted to operate at sea more than three airplanes.

Article IX

The rules as to replacement contained in Annex I to the Part 2 are applicable to vessels of war not exceeding 10,000 tons (10,160 metric tons) standard displacement with the exception of aircraft carriers, whose replacement is governed by the provisions of the Washington treaty.

Article X

Within one month after the date of laying down and the date of completion respectively of each vessel of war, other than capital ships, aircraft carriers and the vessels exempt from limitation under Article VIII, laid down or completed by or for them after the coming into force of the present treaty, the high contracting parties shall communicate to each of the other high contracting parties the information detailed below:

(a) The date of laying the keel and the following particulars:

The classification of the vessel;
Standard displacement in tons and metric tons;
The principal dimensions, namely, length at water line, extreme beam at or below water line;
Mean draft at standard displacements;
The caliber of the largest gun.

(b) The date of completion together with the foregoing particulars relating to the vessel at that date.

The information to be given in the case of capital ships and aircraft carriers is governed by the Washington treaty.

Article XI

Subject to the provisions of Article II of the present treaty, the rules for disposal contained in Annex II to this Part 2 shall be applied to all vessels of war to be disposed of under the treaty, and to aircraft carriers as defined in Article III.

Article XII

1. Subject to any supplementary agreements which may modify as between the high contracting parties concerned the lists in Annex III of this Part 2, the special vessels shown therein may be retained and their tonnage shall not be included in the tonnage subject to limitation.

2. Any other vessel constructed, adapted or acquired to serve the purposes for which these special vessels are retained shall be charged against the tonnage of the appropriate combatant category, according to the characteristics of the vessel, unless such vessel confofms to the characteristics of vessels exempt from limitation under Article VIII.

3. Japan may, however, replace the minelayers *Aso* and *Tokiwa* by two new minelayers before Dec. 31, 1936. The standard displacement of each of the new vessels shall not exceed 5,000 tons (5,080 metric tons); their speed shall not exceed twenty knots, and their other characteristics shall conform to the provisions of paragraph (b) of Article VIII. The new vessels shall be regarded as special vessels and their tonnage shall not be chargeable to the tonnage of any combatant category. The *Aso* and *Tokiwa* shall be disposed of in accordance with Section 1 or 2 of Annex II to this Part 2 on completion of the replacement vessels.

4. The *Asama, Yakumo, Idzumo, Iwate,* and *Kasuga* shall be disposed of as stated in Section 1 or 2 of Annex II to this Part 2 when the first three vessels of the *Kuma* class have been replaced by new vessels. These three vessels of the *Kuma* class shall be reduced to the condition prescribed in Section 5, sub-paragraph (b) 2 of Annex II to this Part 2, and are to be used for training ships, and their tonnage shall not thereafter be included in the tonnage subject to limitation.

Article XIII

Existing ships of various types which, prior to the 1st of April, 1930, have been used as stationary training establishments or hulks, may be retained in a non-seagoing condition.

ANNEX 1

RULES FOR REPLACEMENT

Section I

Except as provided in Section 3 of this annex and Annex III of the present treaty, a vessel shall not be replaced before it becomes "over age." A vessel shall be deemed to be "over age" when the following number of years have elapsed since the date of its completion:

(a) For a surface vessel exceeding 3,000 tons (3,048 metric tons), but not exceeding 10,000 tons (10,160 metric tons) standard displacement:

(1) If laid down before the 1st of January, 1920, sixteen years.
(2) If laid down after the 31st of December, 1919, twenty years.

(b) For a surface vessel not exceeding 3,000 tons (3,048 metric tons) standard displacement:

(1) If laid down before the 1st of January, 1921, twelve years.
(2) If laid down after the 31st of December, 1920, sixteen years.

(c) For a submarine: thirteen years.

The keels of replacement tonnage shall not be laid down more than three years before the year in which a vessel to be replaced becomes "over age," but this period is reduced to two years in the case of any replacement surface vessel not exceeding 3,000 tons (3,048 metric tons) standard displacement.

The right of replacement is not lost by delay in laying down replacement tonnage.

Section II

Except as otherwise provided in the present treaty, the vessel or vessels whose retention would cause the maximum tonnage permitted in the category to be exceeded shall, on the completion or acquisition of the replacement tonnage, be disposed of in accordance with Annex II to this Part 2.

Section III

In the event of loss or accidental destruction a vessel may be immediately replaced.

ANNEX 2

RULES FOR DISPOSAL OF VESSELS OF WAR

The present treaty provides for the disposal of vessels of war in the following ways:

(1) By scrapping (sinking or breaking up).
(2) By converting the vessel to a hulk.
(3) By converting the vessel to target use exclusively.
(4) By retaining the vessel exclusively for experimental purposes.
(5) By retaining the vessel exclusively for training purposes. Any vessel of war to be disposed of, other than a capital ship, may either be scrapped or converted to a hulk at the option of the high contracting party concerned.

Vessels, other than capital ships, which have been retained for target usages, experimental or training purposes, shall finally be scrapped or converted to hulks.

Section I

Vessels to Be Scrapped

(a) A vessel to be disposed of by scrapping, by reason of its replacement, must be rendered incapable of warlike service within six months of the date of the completion of its successor, or of the first of its successors if there are more than one. If, however, the completion of the new vessel or vessels be delayed, the work of rendering the old vessel incapable of warlike service shall, nevertheless, be completed within four and a half years from the date of laying the keel of the new vessel, or of the first of the new vessels; but should the new vessel, or any of the new vessels be a surface vessel not exceeding 3,000 tons (3,048 metric tons) standard displacement, this period is reduced to three and a half years.

(b) A vessel to be scrapped shall be considered incapable of warlike service when there shall have been removed and landed or else destroyed in the ship:

(1) All guns and essential parts of guns, fire control tops and revolving parts of all barbettes and turrets;
(2) All hydro-electric machinery for operating turrets;
(3) All fire-control instruments and range finders;
(4) All ammunition, explosives, mines, and mine rails;
(5) All torpedoes, warheads, torpedo tubes, and training racks;
(6) All wireless telegraphy installations;
(7) All main propelling machinery or alternatively the armored conning tower and all side armor plate;
(8) All aircraft cranes, derricks, lifts, and launching apparatus. All landing-on or flying-off platforms or alternatively all main propelling machinery;
(9) In addition, in the case of submarines, all main storage batteries, air compressor plants, and baler pumps.

(c) Scrapping shall be finally effected in either of the following ways within twelve months of the date on which the work of rendering the vessel incapable of warlike service is due for completion:

(1) Permanent sinking of the vessel;
(2) Breaking the vessel up; this shall always include the destruction or removal of all machinery, boilers, and armor, and all deck, side, and bottom plating.

Section II

Vessels to be converted to Hulks

A vessel to be disposed of by conversion to a hulk shall be considered finally disposed of when the conditions prescribed in Section I, Paragraph (b) have been complied with, omitting sub-paragraphs (6), (7), and (8), and when the following have been effected:

(1) Mutilation beyond repair of all polishing shafts, thrust blocks, turbine gearing, or main propelling motors, and turbines or cylinders of main engines.
(2) Removal of propeller boxes.
(3) Removal and breaking up of all aircraft lifts, and the removal of all aircraft cranes, derricks, and launching apparatus.

The vessels must be put into the above condition within the same limits of time as provided in Section I for rendering a vessel incapable of warlike service.

Section III

Vessels to Be Converted to Target Use

(a) A vessel to be disposed of by conversion to target use exclusively shall be considered incapable of warlike service when there have been removed and landed, or rendered unserviceable only, the following:

(1) All guns.
(2) All fire-control tops and instruments and main fire-control communication wiring.
(3) All machinery for operating gun mountings or turrets.
(4) All ammunition, explosives, mines, torpedoes, and torpedo tubes.
(5) All aviation facilities and accessories.

The vessel must be put into the above condition within the same limits of time as provided in Section I for rendering a vessel incapable of warlike service.

(b) In addition to the rights already possessed by each high contracting party under the Washington treaty, each high contracting party is permitted to retain, for target use exclusively, at any one time:

(1) Not more than three vessels (cruisers or destroyers), but of these three vessels only one may exceed 3,000 tons (3,048 metric tons), standard displacement.
(2) One submarine.

(c) On retaining a vessel for target use, the high contracting party undertakes not to recondition it for warlike service.

Section IV

Vessels Retained for Experimental Purposes

(a) A vessel to be disposed of by conversion to experimental purposes exclusively shall be dealt with in accordance with the provisions of Section III (a), this annex.

(b) Without prejudice to the general rules, and provided that due notice be given to the other high contracting parties, reasonable variation from the conditions prescribed in Section III (a), this annex, in so far as may be necessary for the purposes of a special experiment, may be permitted as a temporary measure.

Any high contracting party taking advantage of this provision is required to furnish full details of any such variation and the period for which they will be required.

(c) Each high contracting party is permitted to retain for experimental purposes exclusively, at any time:

(1) Not more than two vessels (cruisers or destroyers), but of these two vessels only one may exceed 3,000 tons (3,048 metric tons) standard displacement.
(2) One submarine.

(d) The United Kingdom is allowed to retain, in their present conditions the monitor *Roberts*, the main armament guns and mountings of which have been mutilated, and the seaplane carrier *Ark Royal*, until no longer required for experimental purposes. The retention of these two vessels is without prejudice to the retention of vessels permitted under (c) above.

On retaining a vessel for experimental purposes the high contracting party undertakes not to recondition it for warlike service.

Section V

Vessels Retained for Training Purposes

(a) In addition to the rights already possessed by each high contracting party under the Washington treaty, each high contracting party is permitted to retain for training purposes exclusively the following vessels:

United States: One capital ship (*Arkansas* or *Wyoming*);

France: Two surface vessels, one of which may exceed 3,000 tons (3,048 metric tons) standard displacement;

United Kingdom: One capital ship (*Iron Duke*);

Italy: two surface vessels, one of which may exceed 3,000 tons (3,048 metric tons) standard displacement;

Japan: One capital ship (*Hiyei*), three cruisers (*Kuma* class).

(b) Vessels retained for training purposes under the provision of Paragraph (a) shall, within six months of the date on which they are required to be disposed of, be dealt with as follows:

Capital Ships

The following is to be carried out:

(1) Removal of main armament guns, revolving parts of all barbettes and turrets; machinery for operating turrets; but three turrets with their armament may be retained in each ship;
(2) Removal of all ammunition and explosives in excess of the quantity required for target practice training for the guns remaining on board;
(3) Removal of conning tower and the side armor belt between the foremost and aftermost barbettes;
(4) Removal or mutilation of all torpedo tubes;
(5) Removal or mutilation on board of all boilers in excess of the number required for a maximum speed of eighteen knots.

Cruisers Retained by France, Italy, and Japan

(1) Removal of one-half of guns, but four guns of main caliber may be retained on each vessel;
(2) Removal of all torpedo tubes;
(3) Removal of all aviation facilities and accessories.
(4) Removal of one-half of boilers.

(c) The high contracting party concerned undertakes that vessels retained in accordance with the provisions

of this section shall not be used for any combatant purpose.

ANNEX 3

SPECIAL VESSELS

UNITED STATES

Name	Type of Vessel	Displacement Tons
Aroostook	minelayer	4,950
Oglala	minelayer	4,950
Baltimore	minelayer	4,413
San Francisco	minelayer	4,083
Cheyenne	monitor	2,800
Helena	gunboat	1,392
Isabel	yacht	938
Niagara	yacht	2,600
Bridgeport	destroyer tender	11,750
Dobbin	destroyer tender	12,450
Melville	destroyer tender	7,150
Whitney	destroyer tender	12,450
Holland	submarine tender	11,570
Henderson	naval transport	10,000
Total		91,496

FRANCE

Name	Type of Vessel	Displacement Tons
Castor	minelayer	3,150
Pollux	minelayer	2,461
Commandant Teste	seaplane carrier	10,000
Aisne	dispatch vessel	600
Marne	dispatch vessel	600
Ancre	dispatch vessel	604
Scarpe	dispatch vessel	604
Swippe	dispatch vessel	604
Dunkerque	dispatch vessel	604
Laffaux	dispatch vessel	644
Bapaume	dispatch vessel	644
Nancy	dispatch vessel	644
Calais	dispatch vessel	644
Lassigny	dispatch vessel	644
Les Eparges	dispatch vessel	644
Remiremont	dispatch vessel	644
Tahure	dispatch vessel	644
Toul	dispatch vessel	644
Hainaultal	dispatch vessel	644
Lievin	dispatch vessel	644
(———)	net layer	2,293
Total		28,644

BRITISH COMMONWEALTH OF NATIONS

Name	Type of Vessel	Displacement Tons
Adventurer	minelayer (United Kingdom)	6,740
Albatross	seaplane carrier (Australia)	5,000
Erebus	monitor (United Kingdom)	7,200
Terror	monitor (United Kingdom)	7,200
Marshal Soult	monitor (United Kingdom)	6,400
Clive	sloop (India)	2,021
Medway	submarine depot ship (United Kingdom)	15,000
Total		49,561

ITALY

Name	Type of Vessel	Displacement Tons
Miragli	seaplane carrier	4,880
Faa Dibruno	monitor	2,800
Monte Grappa	monitor	605
Montello	monitor	605
Monte Cengio	ex-monitor	500
Monte Novegno	ex-monitor	500
Campania	sloop	2,070
Total		11,960

JAPAN

Name	Type of Vessel	Displacement Tons
Aso	minelayer	7,180
Tokiwa	minelayer	9,240
Asama	old cruiser	9,240
Yakumo	old cruiser	9,010
Idzumo	old cruiser	9,240
Iwate	old cruiser	9,240
Kasuga	old cruiser	7,080
Yodo	gunboat	1,320
Total		61,430

PART 3

The President of the United States of America, his Majesty the King of Great Britain, Ireland and the British Dominions Beyond the Seas, Emperor of India, and his Majesty the Emperor of Japan, have agreed as between themselves to the provisions of this Part 3:

Article XIV

The naval combatant vessels of the United States, the British Commonwealth of Nations and Japan, other than capital ships, aircraft carriers, and all vessels exempt from limitation under Article VIII, shall be limited during the term of the present treaty as provided in this Part 3, and in the case of special vessels, as provided in Article XII.

Article XV

For the purpose of this Part 3 the definition of the cruiser and destroyer categories shall be as follows:

Cruisers

Surface vessels of war, other than capital ships or aircraft carriers, the standard displacement of which exceeds 1,850 tons (1,880 metric tons), or with a gun above 5.1 inches (130 mm.) caliber.

The cruiser category is divided into the following subcategories:

(a) Cruisers carrying a gun above 6.1 inches (155 mm.) caliber.

(b) Cruisers carrying a gun not above 6.1 inches (155 mm.) caliber.

Destroyers

Surface vessels of war the standard displacement of which does not exceed 1,850 tons (1,880 metric tons), and with a gun not above 5.1 inches (130 mm.) caliber.

Article XVI

1. The completed tonnage in the cruiser, destroyer and submarine categories which is not to be exceeded on the 31st of December, 1936, is given in the following table:

Categories:	United States	United Kingdom	Japan
Cruisers:			
(a) With guns of more than 6.1 inches (155 mm.) caliber	180,000 tons (182,880 metric tons)	146,800 tons (149,149 metric tons)	108,400 tons (110,134 metric tons)
(b) With guns of 6.1 inches (155 mm.) caliber or less	143,500 tons (145,796 metric tons)	192,200 tons (195,275 metric tons)	100,450 tons (102,057 metric tons)
Destroyers	150,000 tons (152,400 metric tons)	150,000 tons (152,400 metric tons)	105,450 tons (107,188 metric tons)
Submarines	52,700 tons (53,543 metric tons)	52,700 tons (53,543 metric tons)	52,700 tons (53,543 metric tons)

2. Vessels which cause the total tonnage in any category to exceed the figures given in the foregoing table shall be disposed of gradually during the period ending on Dec. 31, 1936.

3. The maximum number of cruisers of sub-categories (a) shall be as follows:

For the United States, eighteen; for the United Kingdom, fifteen; for Japan, twelve.

4. In the destroyer category not more than 16 per cent of the allowed total tonnage shall be employed in vessels of over 1,500 tons (1,524 metric tons) standard displacement. Destoyers completed or under construction on April 1, 1930, in excess of this project may be retained, but no other destroyers exceeding 1,500 tons (1,524 metric tons) standard displacement shall be constructed or acquired until a reduction of such 16 per cent has been effected.

5. Not more than 25 per cent of the allowed total tonnage in the cruiser category may be fitted with a landing-on platform or deck for aircraft.

6. It is understood that the submarines referred to in paragraphs 2 and 3 of Article VII will be counted as part of the total submarine tonnage of the high contracting parties concerned.

7. The tonnage of any vessels retained under Article XIII or in accordance with Annex II to Part 2 of the present treaty shall not be included in the tonnage subject to limitation.

Article XVII

A transfer not exceeding 10 per cent of the allowed total tonnage of the category or sub-category into which the transfer is to be made shall be permitted between cruisers of the sub-category (b) and destroyers.

Article XVIII

The United States contemplates the completion by 1935 of fifteen cruisers of sub-category (a) of an aggregate tonnage of 150,000 tons (152,400 metric tons). For each of the remaining three cruisers of sub-category (a) which it is entitled to construct the United States may elect to substitute 15,166 tons (15,409 metric tons) of cruisers of sub-category (b)

Subject to this option the sixteenth unit will not be laid down before 1933 and will not be completed before 1936; the seventeenth will not be laid down before 1934 and will not be completed before 1937; the eighteenth will not be laid down before 1935 and will not be completed before 1938.

Article XIX

Except as provided in Article XX, the tonnage laid down in any category subject to limitation in accordance with Article XVI shall not exceed the amount necessary to reach the maximum allowed tonnage of the category, or to replace vessels that become "over age" before Dec. 31, 1936. Nevertheless, replacement tonnage may be laid down for cruisers and submarines that become "over age" in 1937, 1938, and 1939, and for destroyers that become "over age" in 1937 and 1938.

Article XX

Notwithstanding the rules for replacement contained in Annex I to Part 2:

(a) The *Frobisher* and *Effingham* (United Kingdom) may be disposed of during the year 1936. Apart from the cruisers now under construction, the total replacement tonnage of cruisers to be completed, in the case of the United Kingdom, prior to Dec. 31, 1936, shall not exceed 91,000 tons (92,456 metric tons).

(b) Japan may replace the *Tama* by new construction to be completed during the year 1936.

(c) In addition to replacing destroyers becoming "over age" before Dec. 31, 1936, Japan may lay down in each of the years 1935 and 1936, not more than 5,200 tons (5,283 metric tons) to replace part of the vessels that become "over age" in 1938 and 1939.

(d) Japan may anticipate replacement during the term of the present treaty by laying down not more than 19,200 tons (19,507 metric tons) of submarine tonnage, of which not more than 12,000 tons (12,192 metric tons) shall be completed by Dec. 31, 1936.

Article XXI

If, during the term of the present treaty, the requirements of the national security of any high contracting party in respect of vessels of war limited by Part 3 of the present treaty are, in the opinion of that party, materially affected by new construction of any power other than those who have joined in Part 3 of this treaty, that high contracting party will notify the other parties to Part 3 as to the increase required to be made in its own tonnages within one or more of the categories of such vessels of war, specifying particularly the proposed increases and the reasons, therefor, and shall be entitled to make such increase. Thereupon the other parties to Part 3 of this treaty shall be entitled to make a proportionate increase in the category or categories specified; and the said other parties shall promptly advise with each other through diplomatic channels as to the situation thus presented.

PART 4

Article XXII

The following are accepted as established rules of international law:

(1) In their action with regard to merchant ships, submarines must conform to the rules of international law to which surface vessels are subject.

(2) In particular, except in case of persistent refusal to stop on being duly summoned, or of active resistance to visit or search a warship, whether surface vessel or submarine boat, may not sink or render incapable of navigation a merchant vessel without having first placed passengers, crew and ship's papers in a place of safety. For this purpose the ship's boats are not regarded as a place of safety unless the safety of the passengers and crew is assured, in the existing sea and weather conditions, by the proximity of land, or the presence of another vessel which is in a position to take them on board.

The high contracting parties invite all other powers to express their assent to the above rules.

PART 5

Article XXIII

The present treaty shall remain in force until Dec. 31, 1936, subject to the following exceptions:

(1) Part 4 shall remain in force without any limit of duration;

(2) The provisions of Articles III, IV, and V and Article II, so far as may relate to aircraft carriers, shall remain in force for the same period as the Washington treaty.

Unless the high contracting parties should agree otherwise by reason of a more generally known agreement limiting naval armaments, to which they all become parties, they shall meet in conference in 1935 to frame a new treaty to replace and to carry out the purposes of the present treaty, it being understood that none of the provisions of the present treaty shall prejudice the attitude of any of the high contracting parties at the conference agreed to.

Article XXIV

1. The present treaty shall be ratified by the high contracting parties in accordance with their respective constitutional methods and the ratification shall be deposited at London as soon as possible. Certified copies of all the process verbaux of the deposit of ratification will be transmitted to all the high contracting parties.

2. As soon as the ratifications of the United States of America, of his Majesty the King of Great Britain, Ireland and the British Dominions Beyond the Seas, Emperor of India, in respect of each and all of the members of the British Commonwealth of Nations as enumerated in the preamble of the present treaty, and of his Majesty the Emperor of Japan, have been deposited, the treaty shall come into force in respect of the said high contracting parties.

3. On the date of the coming into force referred to in the preceding paragraphs, Parts 1, 2, 4, and 5 of the present treaty will come into force in respect to the French Republic and the Kingdom of Italy if their ratifications have been deposited at that date; otherwise these parts will come into force in respect of each of these powers on the deposit of their ratifications.

4. The rights and obligations resulting from Part 3 of the present treaty are limited to the high contracting parties mentioned in Paragraph 2 of this article.

The high contracting parties will agree as to the date on which and the conditions under which the obligations assumed under the said Part 3 by the high contracting parties mentioned in Paragraph 2 of this article will bind them in relation to France and Italy. Such agreement will determine at the same time the obligations of France and Italy in relation to the other high contracting parties.

Article XXV

After the deposit of the ratifications of all the high contracting parties, his Britannic Majesty's Government in the United Kingdom, Great Britain and Northern Ireland will communicate, on their behalf, the provisions inserted in Part 4 of the present treaty to all governments, inviting them to accede thereto definitely and without limit of time.

Such accession shall be effected by a declaration addressed to his Britannic Majesty's Government in the United Kingdom, Great Britain and Northern Ireland.

Article XXVI

The present treaty, of which the French and English texts are both authentic, shall remain deposited in the archives of his Britannic Majesty's Government in the

United Kingdom. Duly certified copies thereof shall be transmitted to the governments of all the high contracting parties. In faith whereof the above named plenipotentiaries have signed the present treaty and have affixed thereto their seals.

Done at London, the 22d day of April, 1930.

TREATY SENT TO SENATE.—Immediately upon the return of the American delegation from London, President Hoover on May 1 presented the naval treaty to the Senate for ratification. It remained problematical whether ratification would be accomplished before the end of the present session, set tentatively for June 15, in view of the purpose of the Foreign Affairs and Naval Committees to examine carefully the significance of the treaty in both its naval and political aspects. It will have strong support from Senator Borah, as well as from Senators Robinson and Reed of the American delegation at London.

UNITED STATES

PRESIDENT HOOVER ON NATIONAL DEFENSE.—In a speech at the Washington congress of the Daughters of the American Revolution on April 14, President Hoover took occasion to express his ideas on various aspects of foreign and military policy. While lauding the London Naval Treaty and the Kellogg-Briand pact as important steps in the direction of international peace, the President added that "until the peace machinery of the world has been developed and tested over long years, we must maintain such forces of defense as will at every moment prevent the penetration of a hostile force on our borders." The President renewed his advocacy of American adherence to the World Court.

Some special interest was attached abroad to his remark that "The difficulties in the instance of the Chinese-Russian dispute [over the Manchurian Railway] show the clear need of some method of mobilization of public opinion against the violation of the Kellogg pact."

INTERNATIONAL AGREEMENTS

ANGLO-SOVIET TRADE TREATY.—A commercial treaty between the British Government and the Soviet republic was signed at London on April 16. According to reports from Moscow, it was received there with some enthusiasm, as an offset to the hostility which the recent Soviet anti-religious policy and other activities have aroused in all quarters.

WORLD BANK ORGANIZATION.—As anticipated, the directors of the new Bank of International Settlements, meeting for the first time at Basle on April 22, elected the senior American director, Gates W. McGarrah, to the office of president. The other American director, Mr. Leon Fraser, will reside permanently at Basle. Pierre Quesnay of France was made director-general, or manager. The organization of the bank could not be carried further owing to delay in ratification of the Young Plan on the part of England and Italy, although France is eager to put the bank into operation as soon as possible in order to hasten the issue of the first $300,000,000 loan based on German reparations.

INDIA AND THE FAR EAST

REVOLT IN INDIA.—As was inevitable, the campaign of "mass civil disobedience" in India inaugurated by Mahatma Gandhi led rapidly to bloodshed and violent revolt, and throughout the Orient quickened the feeling of hostility toward western rule. The April crisis had its beginning with the march of Ghandi and a small company of followers from Ahmadabad to the Gulf of Cambay, March 12-April 6, and their defiance of the government salt tax by extracting salt from sea water. Excitement was further stimulated by the native press, and in the middle of April fierce riots broke out in Calcutta, Karachi, and other Indian cities. At Peshawar on April 23 British troops were forced to use machine guns against street mobs. According to subsequent reports, there was disaffection in a regiment of native Hindu troops at Peshawar, which necessitated the removal of one battalion. Leaders of the movement, including two of Gandhi's sons, were imprisoned, and at the begining of May it appeared to be the government's purpose to put the Mahatma himself under arrest. The Viceroy, Lord Irvin, on April 27, issued strict ordinances curbing the Indian press.

FRENCH DIFFICULTIES IN INDO-CHINA.—The British difficulties in India were paralleled on a lesser scale by the recent spread of communistic propaganda and disaffection

among the native troops in French Indo-China. According to Baltimore *Sun* correspondence of April 25, the French met the trouble with vigorous measures, making wholesale arrests, executing thirteen alleged leaders, and taking steps to close the Chinese frontier.

NEW RUSSIAN RAILWAY.—At the close of April the Soviet Government announced the opening of a new railway, 1,700 miles in length, running from Aris in Turkestan northeast to the Trans-Siberian Railroad at Novosibirsk and paralleling the Chinese frontier for some 700 miles. Aside from its military possibilities the new road will facilitate the transfer of Russian wheat into Turkestan and the development of cotton growing in the latter region, while it will also bring Russia closer to the markets of western China.

THE PHILIPPINE PROBLEM.—The present importance of the question of American control of the Philippines is again emphasized by two articles in the May *Current History*, one by Major General Henry T. Allen, strongly arguing for the continuance of American rule, and the second by the Philippine political leader Manuel Roxas presenting "A Plea for Independence." General Allen quotes both the reports of the Forbes-Wood and the subsequent Carmi Thompson investigations as against immediate freedom for the islands, and contends that their retention is essential not only to the welfare of the Filipinos but to our own best interests in the Orient.

BOOK DEPARTMENT

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THE GREAT CRUSADE. By Lieutenant Colonel Jennings C. Wise, D.S.C., Inf. U. S. Army, A.E.F. New York: Lincoln MacVeagh. 1930. $2.00.

REVIEWED by CAPTAIN JOHN W. THOMASON, JR., *U. S. Marine Corps*

In this chronicle of the great war you become acquainted with one Smith, a former professional soldier, later officer in the old 9th Infantry, who had turned to civilian pursuits. When the newsboys bawled their extras on April 6, 1917, he took the requisite steps toward getting into the war. He sweated in the training camp for officers at Leon Springs, and his reward was a major's commission. He was attached to the 90th Division and transferred to the 80th. Followed a staff interlude, during which he toured the western front in advance of the A.E.F. divisions, and went to the General Staff School at Langres. Returned, at his earnest desire, to the line, he eventually commanded a battalion in the 318th Infantry of the 80th Division and fought in the Argonne. Later, an assignment to the Historical Section of the A.E.F. gave him opportunity to review the war, by study of the terrain and examination of the documents.

The Great Crusade is his record of events and impressions about the whole affair, and it is not the simple narrative of the combat officer: he saw everything. I have read no book on the war into which are compressed so many of the vexed and puzzling cross currents of those crowded months. Within the compass of 319 pages you learn of such diverse matters as the Roosevelt division, the Roosevelt-Wood-Wilson embroglio, the curious workings of the draft, the inefficiency of the Quartermaster Corps, the British ration, the sad fate of those unfortunates who loved not wisely, the untrained condition of the new American divisions, the 1st Division's dash for Sedan, General Pershing's views on the Allied loans, and the attitude adopted by the Historical Section of the A.E.F. towards military history. The operations of the 80th Division around Nantillois and the Bois des Ogons are intimately dealt with.

It is suspected that Smith might have been Lieutenant Colonel Wise himself, for much of his narrative carries the conviction of personal experience, set forth with vividness and sincerity, and with no little feeling. But if the name Smith is fictitious, many other names are not. General Cronkhite is a hero to the writer, and frequent reference is made to actual persons, organizations, places, and operations; and statement and comment take the tale well beyond the bounds of fiction. It is legitimate, therefore, critically to examine some of these statements. No exception need be taken to matters involving the 80th Division: a man has every right to say what he wants to say about his own outfit. But when he talks about other outfits, his facts should be exact. And Smith's attitude towards elements of the Army, particularly regular formations, is somewhat reckless.

For instance: on page 83, "the whole Burges affair had been a series of blunders. The

1st Division had been raided the night it entered the line. The men in the forward posts had not had a chance." This must refer to the II/16th Infantry, November, 1917, when that battalion was raided while occupying, for training purposes, a battalion front in a French regimental sector, under French command, near Burges, in the Artois Salient, in Lorraine, before the division entered the line as a unit. It was a routine trench raid, a common front-line experience for all troops, new or veteran. The men in the forward posts never have a chance in trench raids.

And, on page 92: "In March the 2nd U. S. Division was raided in the Seicheprey Sector and roughly handled." Now, the 26th U. S. Division had an adventure near the village of Seicheprey. The 2d Division was never at Seicheprey.

On page 290 (officer of the Historical Section, A.E.F., talking): "What would happen to one who undertook to tell publicly that American troops were handled so badly at Belleau Wood that the division commander had to be relieved?" Well, somebody might correct one: the fact is that General Bundy, divisional commander of the only American troops who ever fought at Belleau Wood, was relieved some twenty days after the Wood was reduced, to assume command of the new American VI Corps, and Brigadier General Harbord, on whose brigade front Belleau Wood lay, was advanced to the command of the 2d Division.

Also, on page 290, the gloomy pronouncement: "that when our two oldest divisions were brigaded with the Moroccans, one only lived two days and the other four, while the Moroccans went on until relieved by the British." This is simply not true. It touches upon the counter battle southwest of Soissons, which began on July 18, when our 1st and 2d Divisions attacked with the fine Moroccan Division between them. The 2d Division was at all times ahead of the Moroccans on its left, up to the day it was relieved, which was July 20. The Moroccans were themselves relieved by the French 87th Division the night of 20/21 July, command passing at 4:00 A.M., July 21. The 1st Division remained in line two days longer than the Moroccans, was at all times ahead of them, and was relieved by the British 15th Division the night of 22/23 July. The reports, Allied and German, indicate that no substantial advances on the front southwest of Soissons were made by anybody—neither British nor French—after the 1st and 2d U. S. Divisions were withdrawn. The German line, breached on the 18th, was restored, and although forced back, was not broken again.

The foregoing amplifies the statement, on the same page, "that, throughout the fighting on the Marne French divisions with half the bayonets and less than half the fire power advanced on equal fronts abreast of the American units." This is not true of the French 167th Division, which attacked on the left of the 2d Division northwest of Château Thierry on June 6; nor is it true of the French 39th Division which was on the right of the American Infantry at Vaux, on July 1; nor is it true of the French troops which attacked to right and left of the 2d Division in the Champagne in October, 1918; and the records contain also some complaint from the 3d U. S. Division about their exposed flanks along the Marne when they faced, between French formations, the German assault of July 15. In a word, the general statement that French divisions with half the bayonets and less than half the fire power of American divisions advanced on equal fronts, abreast of the American units, lacks proof. They didn't.

Our good formations—and we had a few good formations—could face the best troops in Europe on equal ground, and they were better than most of them. I do not think that the foregoing criticisms are captious. The facts in the cases which I have selected for comment lie in the official records of the armies involved, and are now public documents, readily available to legitimate seekers. When the guns fell silent on that bleak November forenoon in 1918, there began a further Allied effort, to which the A.E.F., was not a party: it was the movement to belittle and to obscure the American achievement at arms. It still goes on, in Europe and elsewhere, and this book falls in line with it.

For the rest, one recognizes most of the sad stories that delighted the scandal mongers of the A.E.F. twelve years ago. They are not new. Such distressing talk attended the War of the Southern Confederacy; and the Crimean War; and, no doubt, the First

and Second Punic Wars. No good end is served by perpetuating these ancient growls. Criticism, to be valuable, must be constructive. The marvel is, not that we did so poorly, but that, under the circumstances, we did so well.

MODERN SEAMANSHIP (KNIGHT). Ninth edition, rewritten, revised, and enlarged by Captain Harry A. Baldridge, U. S. Navy. New York: D. Van Nostrand Co., Inc. 936 pages, 232 plates, and appendix. 1930. $7.50.

Knight's *Seamanship* is a standard reference book on seamanship and is not purely a textbook for instruction of midshipmen. While a few chapters deal solely with naval vessels, they are in the nature of additional chapters, as the remainder of the book covers the field of seamanship in general.

The original author's idea was to teach principles of seamanship so that the book would be of value to anyone following the sea, whether navy, merchant marine, or for pleasure.

The reviser states in his preface that "The present edition was undertaken with the idea of bringing the book thoroughly up to date while adhering as closely as practical to the ideas of the author. . . . . Seamanship is the art of handling ships and principles must be dealt with."

For this reason elaborate details, in many cases, are not gone into, but principles only discussed.

To discuss the various chapters is beyond the limit of this review, but the twenty-nine chapters cover in sequence the following subjects: The Ship; Hull and Fittings of a Ship; Rope; Knotting and Splicing; Mechanical Appliances; Blocks and Tackles; Handling Heavy Weights; Compass, Log, and Lead, and Submarine Signals; Boats; Handling Boats in a Surf; Ground Tackle; Carrying Out Anchors; Steering of Steamers; Rules of the Road; Maneuvering to Avoid Collision; Piloting; Handling a Steamer Alongside a Dock; Placing a Ship in Dry Dock; Weather; Handling Steamers in Heavy Weather; Handling Destroyers; Submarine Chasers; Submarines; Keeping Stations and Maneuvering in Squadron; Towing; Rescuing the Crew of a Wreck; Man Overboard; Stranding; Assistance by Public Vessels to Vessels in Distress.

From a comparison of this edition with previous ones it is apparent that the reviser has carefully scrutinized each chapter and has accepted it only where it completely and thoroughly covered the subject.

Some of the chapters were completely rewritten. These are on the subjects of Placing a Ship in Dry Dock, Weather, and Submarines. The remaining chapters have been revised and brought up to date where necessary.

Additions have been made where, due to developments in facilities, new methods are being used. The plates have also been carefully reviewed, corrected, and where necessary new ones added.

The Appendix covers miscellaneous subjects (some of them purely naval) which do not properly belong in the chapters but are of too much value to a seafaring man to be eliminated.

The subjects covered are sailing ships; tonnage of ships; ships' pumps and their uses; permitted draft of ship; details of U. S. Navy boats; rope, U. S. Navy; nomenclature of decks; preservation of ships; directions for obtaining maneuvering data; buoyage; artificial respiration; instructions for saving drowning man; notes on destroyer handling; use of chips; indication of approach of hurricane.

The subject matter throughout is clearly covered and illustrated by plates and sketches where appropriate and, in addition to being instructive, is interesting reading.

The edition has been so completely brought up to date and covers such a wide field that it is of value to anyone following the sea in any capacity. It is a book which should be in the library of seafaring men and those interested in the sea.

W. S. F.

FERDINAND MAGELLAN. By E. F. Benson. New York: Harper and Brothers, 1929. $4.00.

Reviewed by Instructor Richard S. West, Jr., *U. S. Naval Academy.*

The most notable contribution made by Mr. E. F. Benson in his new volume *Ferdinand Magellan* is the suggestion of what might have transpired had that heroic seaman not met his death in the Philippines.

Had the first circumnavigator of the globe lived to carry out his original plans he would doubtless have precipitated a death struggle between Spain and Portugal over the control of the Spice Islands, the most important possessions of the latter country in the East.

Magellan and his partner, Faleiro, astronomer, magician, caster of horoscopes, etc., fully believed that Sumatra, Java, and the rest of that desirable archipelago lay within the hemisphere set aside by the Pope in 1493 as belonging to Spain. Magellan planned to sail westward "through Spanish territory," to discover a southwestern passage into Oriental waters (by the analogy of Africa, South America could not stretch continuously to the southern pole) and coming upon the Asiatic islands from the east to prove that these lands lay within Spain's jurisdiction.

It was a superb idea; Charles of Spain and his ministers eagerly agreed to finance an expedition. They wrote Magellan's name on the royal pay roll as captain general of the fleet, and with all convenient speed fitted out a command of five vessels. Portuguese spies sniffed danger, King Manuel protested, the machinations of Portuguese hirelings hindered Magellan's preparations. All this merely added fuel to the fire. Magellan overcame all obstacles and set sail.

From this point Magellan's story must be told largely by men not interested in the leader's main purpose. The mutiny of three ship captains at Port St. Julian, the confusing, nerve-racking limbo of antarctic fog, hunger which drove the crews to eat leather from the ships' rigging, finally the treachery of the Philippine tribe which Magellan had Christianized and for whom he lost his life in a foolhardy effort to suppress an enemy tribe—all of these things wrecked the expedition, foiled its purpose. Deprived of their captain general, the demoralized Spanish survivors devoted their energies to procuring food and coconut wine for their bellies and to the difficult work of making their way home over the trade route of the hostile Portuguese.

Mr. Benson is more successful in delineating the lesser figures in the ill-starred expedition than in characterizing its hero. Pigafetta, the naturalist, who kept a faithful journal of the voyage with something of the vivacity of Samuel Pepys, the English diarist, is a very interesting man. So is Enrique, Magellan's slave, who served in the capacity of interpreter. But considering the one-sidedness of the testimony given by the expedition's survivors, Mr. Benson probably had too few proved facts at his command to sketch a full-length portrait of Magellan himself.

THE SEA. By H. A. Marmer. New York and London: D. Appleton and Company. 1930. $3.00.

REVIEWED BY GEORGE W. LITTLEHALES

In the introductory chapters, constituting the first quarter of this book, the author, by logical digestion of the writings of classical geography, unfolds the rise of the influence of the sea in shaping human destinies. There was a time in the history of the world when, by at least two world-old high roads stretching across the width of Persia, the slow caravans passed and passed again bearing fabrics and spices between Asia and Europe —nearly all the world that was known in the geography of that age. Then the sweeping hordes from the northeast interposed a barbaric wedge which closed the main gates of this trade, and Europe began to find the way to Asia in ships. Thus the course of empire, the quest of fame and wealth, the perilous path of heroic adventure—all were launched upon the sea to dispel its myths and legends and make it the great highway of communication by which the bounds of the earth were revealed, and notable consequences brought about in regard to the balance of political power, as when the circumnavigation of the globe by Magellan led to a great controversy about the sovereignty of the high seas which has extended to our own times.

It is thus that human interest is whetted to read and learn the disclosures made in the subsequent chapters with respect to the properties and resources of a medium composed of all the elements known to chemistry, overspreading more than two-thirds of the surface of the globe, throughout all longitudes and nearly from pole to pole, in basins whose cubical content is fourteen-fold greater than the bulk of all the land in the world above sea level. Written in a style adapted to express facts to the layman and abounding in illustrations serving to portray with graphic prominence the results of measurement which other authors have gen-

erally set forth in numerical tables, perhaps with more exactness but with less adaptability to convey cardinal meanings, there follow chapters relating to the physical aspects of the sea and the gain flowing from a knowledge concerning them—brief summaries of present-day investigations dealing with the depths and contour of the ocean bed, with the variations of the level of the surface of the sea, the temperature, the circulation, the physical and chemical properties of sea water, the currents, seiches tides, waves, and the related aspects of astronomy, hydrography, geography, geology, physics, and chemistry.

American readers would be entitled to wish that, in the chapter on the "Attainment of the Poles," while following close upon the record of what foreigners had done in the antecedent steps by which it became known that the South Pole was to be reached by travel over land, the author had allowed himself to recognize also the part performed by the United States Exploring Expedition, which, in the beginning of the year 1840, charted an extent of 1,800 miles of the edge of the Antarctic, and that Lieutenant Charles Wilkes, U. S. Navy, commanding this expedition, was the first of all men to discover that a continent occupies the south polar region. And, likewise, in recounting the course of endeavor which marked the interval of more than four centuries between the first attempts by Cardinal Nicolaus Germanus and the successful sounding of the deep sea, an important link is ignored by passing over the achievement of Midshipman John M. Brooke, U. S. Navy, who, in the year 1854 made the first great improvement in deep-sea sounding by inventing an implement in which, applying Germanus idea of disengaging a weight from the sounding line, the sinker enveloping the sounding tube was detached on reaching the bottom and left behind when the tube was drawn up. It was this invention that paved the way for the introduction of pianoforte wire to replace hempen sounding lines and made plummet soundings of the greatest depths of the ocean basins easily attainable.

RETURN OF THE BRUTE. By Liam O'Flaherty. New York: Harcourt, Brace and Co. 1930. $2.00.

REVIEWED BY INSTRUCTOR RICHARD S. WEST, JR., *U. S. Naval Academy*

Most authors of World War novels are so intrigued by the particular items and episodes of their fascinating material that they fail to achieve a proper amalgamation of that material into an artistic whole. Most of their work from the point of view of art is fact-bound. Rather than as works of art in themselves, we remember their books for some of the amazing individual adventures that they contain. We remember them by parts—unique isolated adventures, incidents, episodes—and fail to see the forest for the trees.

This criticism, however, does not apply to Liam O'Flaherty's latest book, *Return of the Brute*. Nine men in a bombing squad go over the top. They suffer the indescribable agony of uncertainty. From behind the lines come orders which seem, to the men of No. 2 Bombers, commands of a blind and stupid authority. They endure the refinements of physical discomfort, are water-soaked, lousy, faint with hunger, bullied by a brutish and cowardly corporal. They flounder in mud. One poor devil is sucked down in a quicksand gulf. Another is riddled by machine-gun fire. A third has arms and legs blown off by a bomb. A fourth goes mad. Only one of the nine returns from the raid.

All these particular facts are exquisitely gruesome. But the stern tortures of modern warfare fall into the background of O'Flaherty's mind. The author folds back the mantle of external fact and presents an even more exciting drama. With breathless energy we follow the passionate brute conflicts among the men themselves. Private Gunn, a seasoned soldier, undertakes to protect young Private Lamont from the wrath of an overbearing corporal. Lamont's girlish despondency undermines Gunn's better judgment as a soldier, and drives him to insubordination. When at the end Gunn's reason has been overthrown, a terrific struggle ensues on no man's land and Gunn settles his bloody score with the corporal.

O'Flaherty's book is as crammed with facts as the next man's, but it is a complete artistic unit which we remember as a whole. By never allowing us to forget the humanity of his fighting men, the author makes us see the war in a nutshell—we get the emotional experience of war. This Sophoclean quality of O'Flaherty's work consequently awakens tragic terror and pity of the highest sort.

SECRETARY'S NOTES

The Navy under the London Treaty

The full text of the London Treaty will be found in International Notes. The various committees in Congress most vitally interested have the treaty under consideration and final action by the Senate may be expected before long.

In the meantime, steps are being taken to provide for the Navy allowed us under the treaty. New ships of practically all classes, except battleships, will have to be built.

As usual, the opposition is complaining about naval expenditures, conveniently forgetting that we have to pay for the naval holiday we enjoyed in solitary splendor from 1922 to 1928. We didn't build then, so we have to make up the shortage now.

Also, in comparing our naval expenditures with those of Great Britain, the difference in construction costs due to lower wages, cheaper material, etc., is forgotten. That Great Britain governs almost four times as many people as we for the same annual budget is never commented upon; that we spend less of our annual income, on a percentage basis, than any of the large naval powers is passed unnoticed.

It is all a part of the game we suppose, but it leaves a bad taste in the mouth.

Changes in officers of the Institute

At the last meeting of the Board of Control of the U. S. Naval Institute, the Secretary-Treasurer, who is about to go to sea, submitted his resignation to take effect June 1. The Board accepted the resignation and appointed Captain A. T. Church, U. S. Navy, a member of the Board, to succeed Captain MacFall.

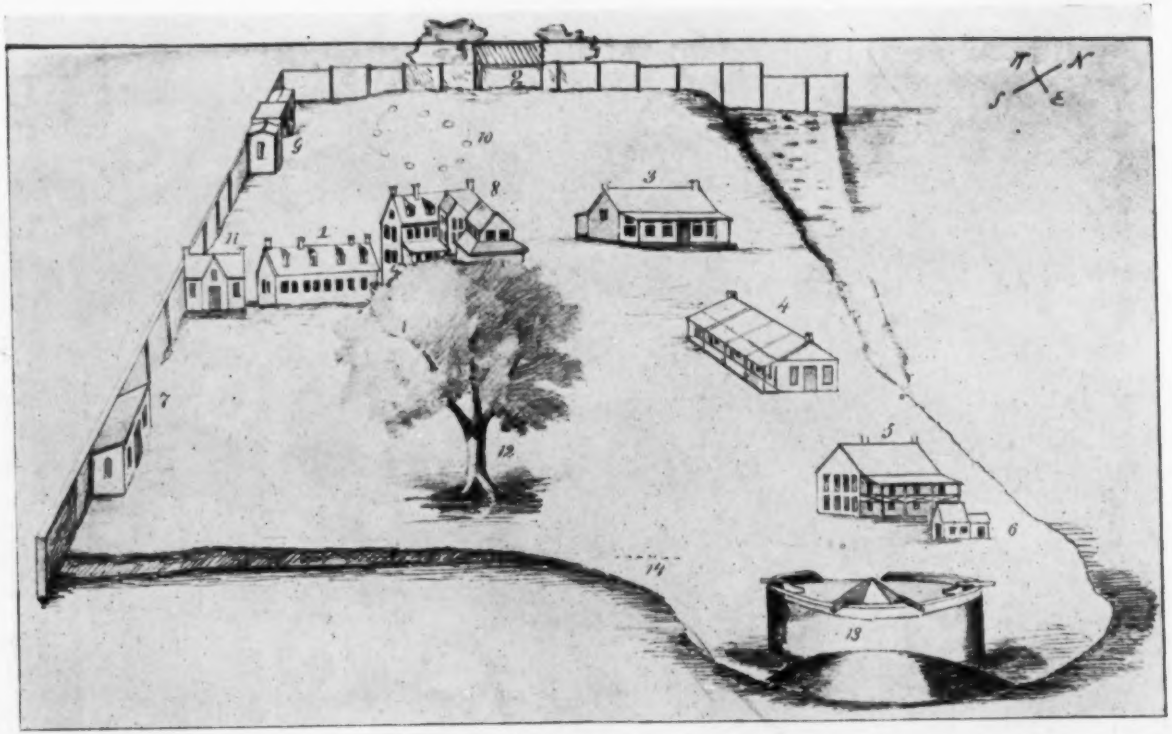
The Board also elected Commander A. T. Beauregard, U. S. Navy, to the Board to fill the vacancy created by Captain Church's appointment.

Three new books

Among the advertisements will be found a notice of three books which have just been brought out by the Naval Institute. We believe you will want at least one of these three, or even more. We advise you to investigate the *Watch Officer's Guide* especially, a handy and useful little book. You will feel lots more comfortable when you have the deck with one in your pocket. It is just impossible to tell you all it contains; you had better get one and see for yourself!

Just be careful

A good many members and others mail checks to the Institute made payable to R. C. MacFall. That was all right as long as I was connected with the Institute, but now it will only cause you annoyance and inconvenience when they are returned to be corrected. Just make out your money orders and checks made payable to U. S. Naval Institute.



FORT SEVERN IN 1845 (FROM AN OLD MAP)

The United States Naval Academy as it was at its beginning. Rear Admiral Simpson entered the Navy as a midshipman in 1840, and was in the first class that was attached to the Naval Academy in 1845-46. He graduated in 1846.

The numbers refer to the building, etc., as named after the Naval School was established. 1. Buchanan Row. 2. The Abbey. 3. Mess and recitation rooms. 4. Apollo Row. 5. Rowdy Row. 6. Brandywine cottage. 7. The Gas house. 8. Superintendent's house. 9. Gate house. 10. Ring of poplar trees. 11. Chaplain's house. 12. Old mulberry tree. 13. Fort Severn. 14. Site of practice battery.

From a photograph at the Naval Academy

REAR ADMIRAL EDWARD SIMPSON, *U. S. Navy*
The eighth president of the U. S. Naval Institute, 1885-87

The Battle at Blanc Mont

This article is now available in book form. We feel rather proud of its looks and, from reports of those who have gotten the bound copy, they are pleased too. You may not know it but the article was entirely reset, with larger type, on the advice of our printers who were desirous of putting out a book that would be a credit to both the Institute and themselves.

We would appreciate if those who have bought the book show it to their friends. The book stands on its merits.

Special Numbers

Two special numbers of the PROCEEDINGS will appear in the near future. The August issue will feature Aviation and will contain articles and illustrations devoted to this important part of the Navy.

The October issue will be a Special Information number in which officers in responsible positions in the Navy will coöperate in presenting the work of the Navy in an interesting way. We hope that both of these issues will appeal to our readers.

Swan song

Having completed my tour of shore duty and being ordered to sea, it becomes necessary for me to resign as Secretary-Treasurer of the U. S. Naval Institute. It also becomes necessary for me to express my appreciation for the interest shown by the members in the PROCEEDINGS. This interest has been helpful in many ways but especially in that it keeps the fact that the Institute belongs to the members constantly before one.

Not being born to the purple of editorship, my task was an entire departure from anything I had ever done. Such success as I may have had is entirely due to my understudy of my predecessor, Captain H. A. Baldridge, through whose earnest efforts the PROCEEDINGS have made such a splendid advance.

Whether my efforts have been in vain or have been successful is of no moment now. The Naval Institute will go on. That is one of the fine things about the service and things connected with the service. The individual doesn't matter; it's the institution. The institution must go on.

Personally I have enjoyed my work with the Naval Institute. It was interesting, it presented another phase of life, it brought me in contact with splendid people in the service and in the business world. And here I wish to express my appreciation for the tireless support of the staff of the Institute and the civilian personnel. Also, for the coöperation of our printers, the George Banta Publishing Company, of Menasha, Wisconsin, who have been ever helpful.

Now, if we have been captious or capricious or cantankerous, we hope it will be forgiven. The last two years have been rather hectic with so many self-appointed experts deciding the needs of the national defense in general and of the Navy in particular. When deliberate deception and misrepresentation are resorted to in order to disrupt the national defense, it requires a lot of self-control to remain quiescent.

So we go back to our regular duty with a feeling of pleasure that we have had this opportunity. Think of the advantage, too, in being able to write without having your stuff turned down by the editor!

Those who have been disappointed in my efforts will now find relief, while the others will find a more experienced and better editor in my successor, who at one time occupied a similar position with the American Society of Naval Engineers.

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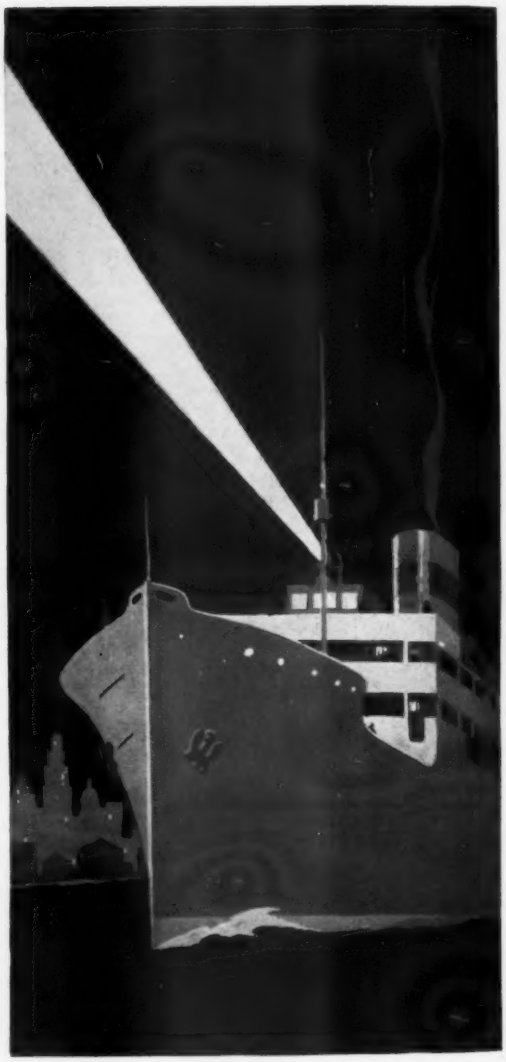

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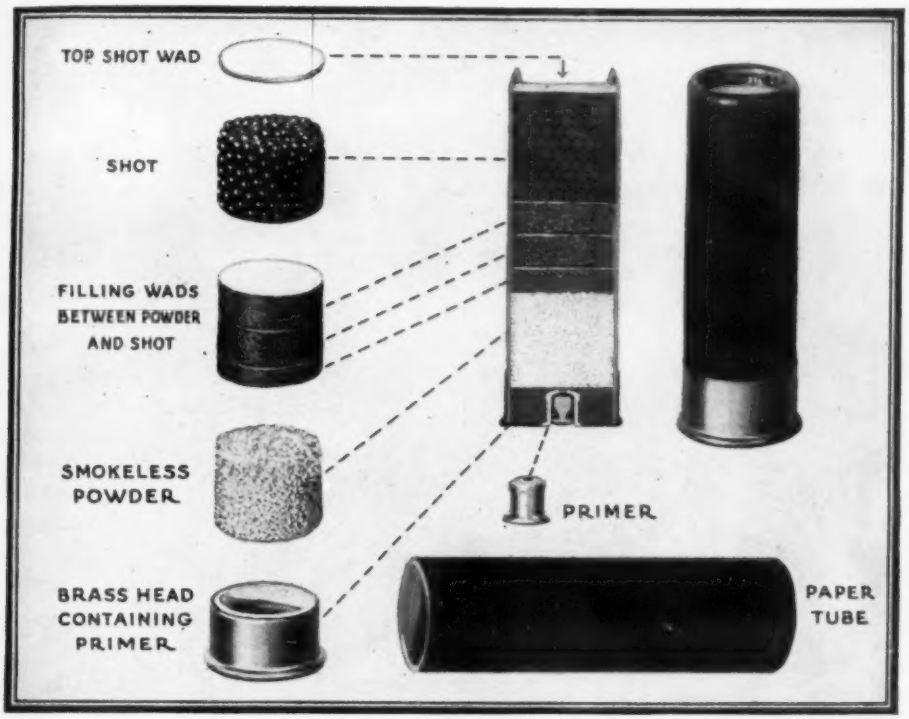

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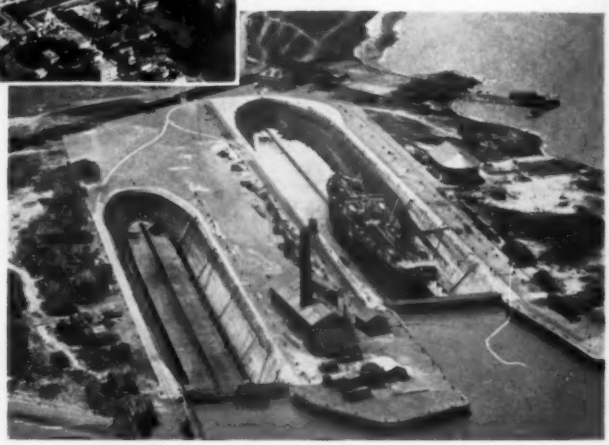

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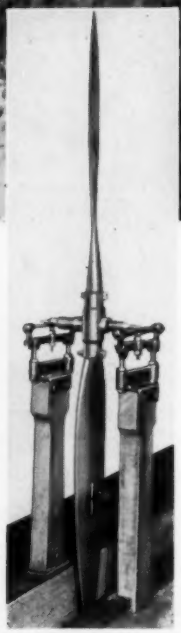

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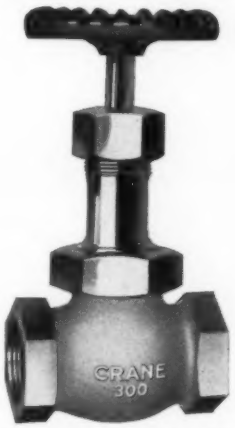

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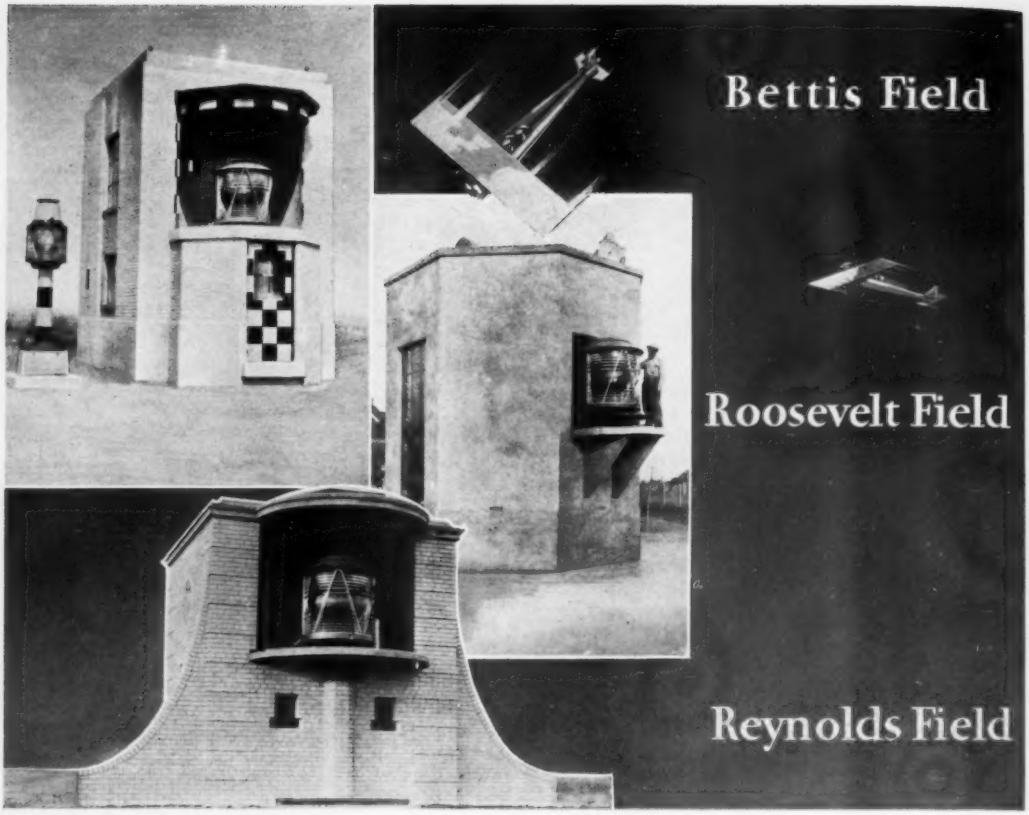

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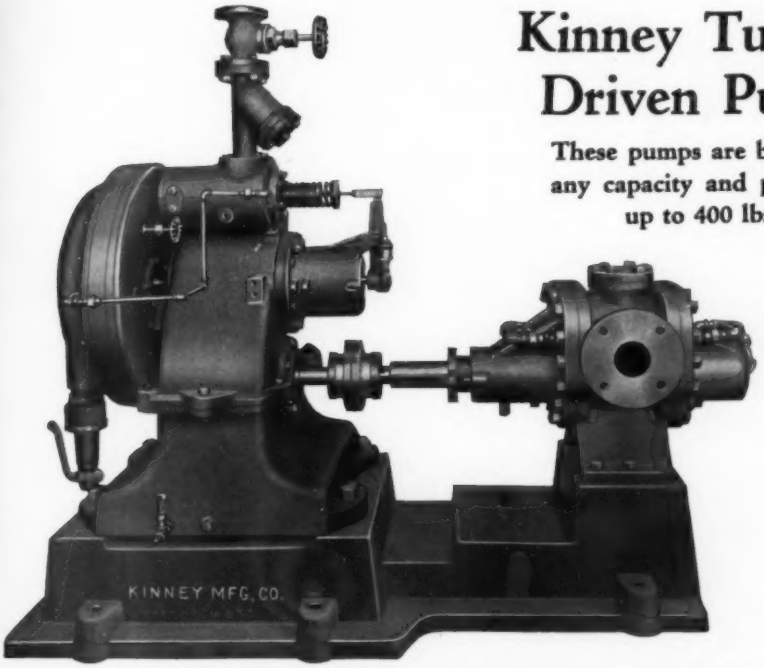

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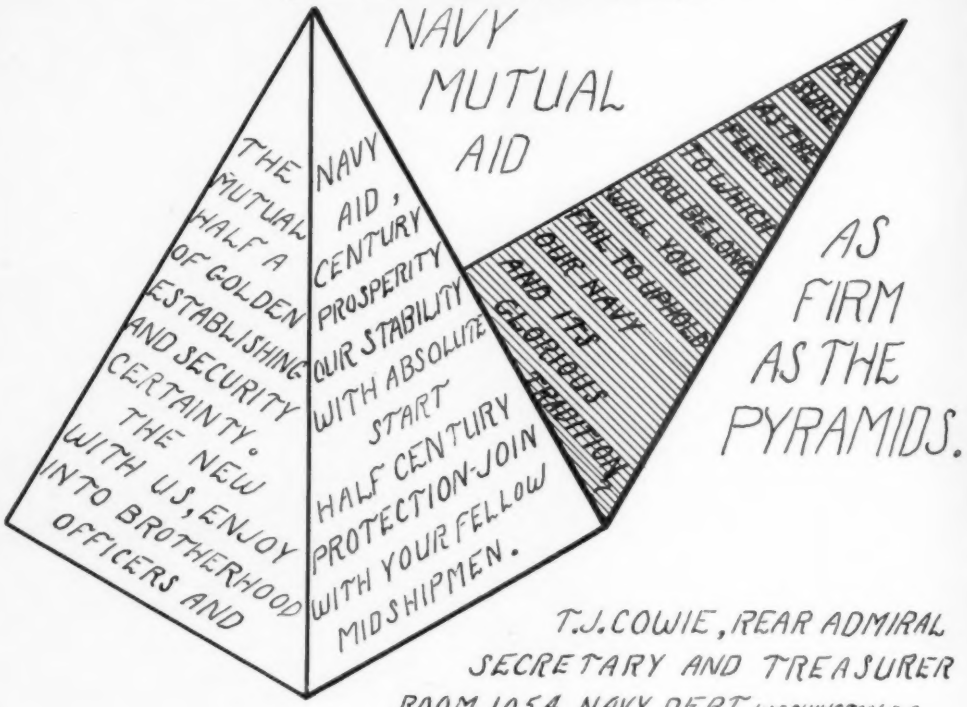
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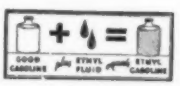

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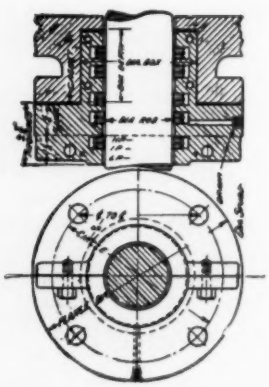

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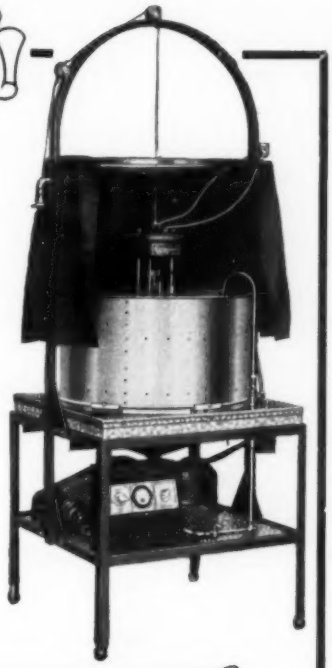

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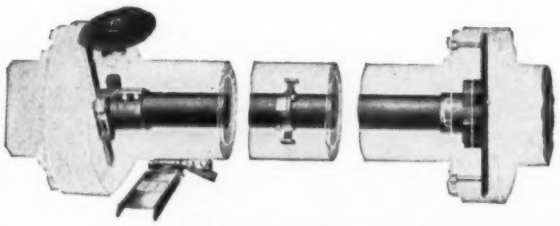

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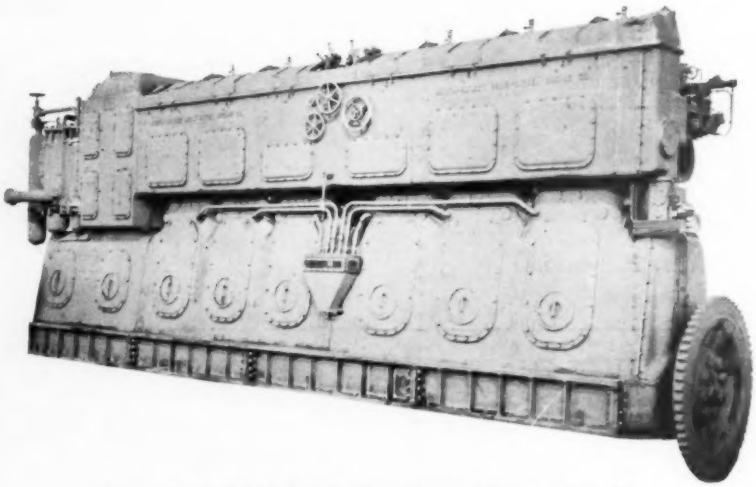

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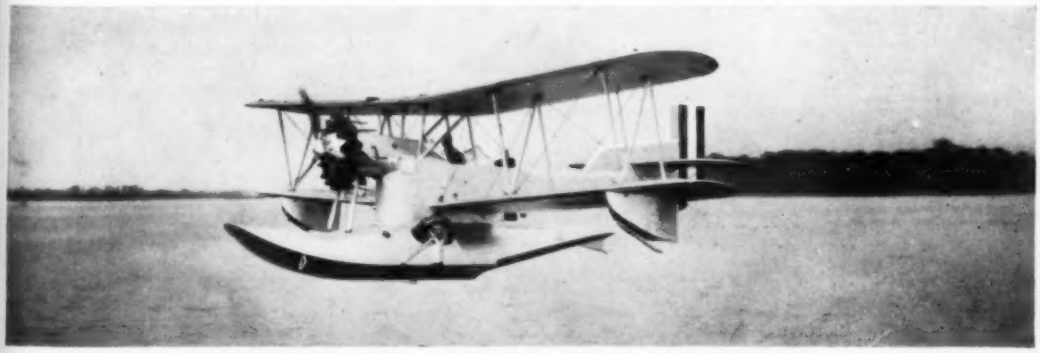

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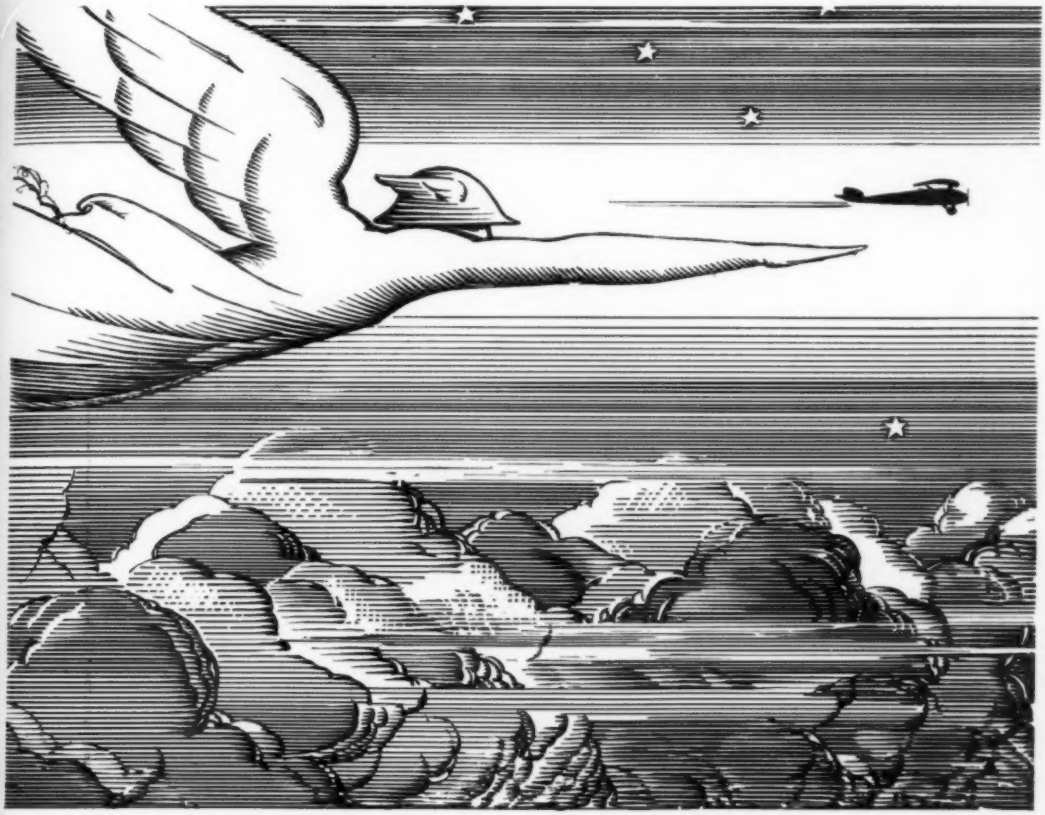

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Naval Institute Prize Essay, 1931

A PRIZE NOT TO EXCEED FIVE HUNDRED DOLLARS WITH A GOLD MEDAL, and a life membership in the Institute (unless the author is already a life member, in which case he will receive the commuted value thereof), is offered by the Naval Institute for the best essay submitted on any subject pertaining to the naval profession.

The following rules will govern this competition:

1. The award of the prize to be made by the Board of Control, voting by ballot and without knowledge of the names of the competitors.

2. Each competitor to send his essay to the Secretary-Treasurer in a sealed envelope marked "Prize Essay Contest." The name of the writer shall not appear on the essay, but instead thereof a motto. Accompanying the essay a separate sealed envelope will be sent to the Secretary-Treasurer, with the motto on the outside and the writer's name and motto inside. This envelope will not be opened until after the decision of the board. Essays must be received on or before January 1, 1931.

3. In addition to the "Naval Institute Prize," one or more essays may receive "Honorable Mention," if of sufficient merit to justify that award; or, in the event that no essay is adjudged of sufficient merit to receive the "Prize," the best essay submitted may receive "Honorable Mention" in lieu thereof.

4. In case one or more essays receive "Honorable Mention" the writers thereof will each receive a prize, the amount of such awards to be decided by the Board of Control in each case.

5. Announcement of awards will be made as soon as practicable after January 1, 1931.

6. Essays awarded the "Naval Institute Prize" or "Honorable Mention" will be published in the NAVAL INSTITUTE PROCEEDINGS as soon as practicable. Essays not awarded a prize may be published at the discretion of the Board of Control, and the writers of such articles shall be compensated at the established rate for articles not submitted in competition.

7. Articles should be limited to approximately 8,000 words, but shorter articles will receive equal consideration.

8. In event of the prize being awarded to the winner of a previous year, a gold clasp suitably engraved will be given in lieu of the medal.

9. All essays must be typewritten, double spaced, and submitted in duplicate.

R. C. MACFALL
Captain, U.S.N., Secretary-Treasurer

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